# Dadant's Bee Comb Foundations

## Gilt-Edge Foundation

**Modern Magic** — You can assemble frame and foundation in less than a minute, with no wiring or embedding to do. When you use the new Lewis Nailless Topbar Frame and slip a sheet of Dadant's Gilt-Edge Foundation in, there you are! Only two nails to use; no frame wiring to do; no wax embedding to do.

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## Crimp-wired Foundation —

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## Supreme Super Foundation —

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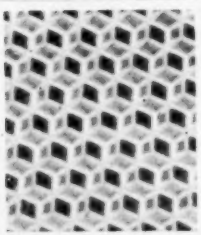

## Plain (unwired) Foundation —

Many beekeepers have their own methods of supporting bee comb foundation and putting it in the frame; ways they have used for years. For them Dadant's Plain Foundation offers an inexpensive, beautifully milled foundation, without wires, that will give the utmost in satisfaction.

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## The Cover Winner

# Harvey B. Lovell

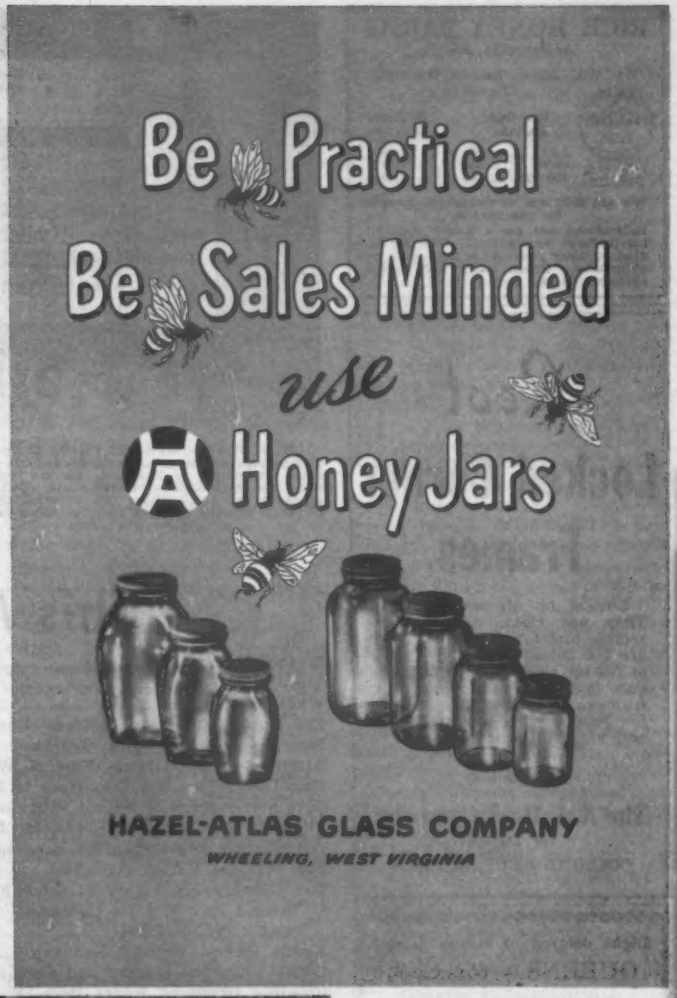
### Louisville, Kentucky

This month's winner is a professor of biology at the University of Louisville who has an interest in bees and pollination dating back to his boyhood in Maine. He writes, "One of my earliest remembrances is 'helping' my father, John H. Lovell, nail together beehives and frames. Another remembrance is my father's color vision experiments with the honey bee. He had paper flowers of many hues mounted in various ways all over the place."

One of the professor's hobbies is photography of all forms of wild life in both black and white and color. He has traveled extensively pursuing this interest. He is the editor of the "Kentucky Warbler," a journal of ornithology, and has written many articles on various phases of biology, the majority being on birds and pollination. He is now compiling a catalog on the honey plants of eastern and central United States.

**Cover Picture**

"The Larger Goat's Beard (**Tragopogon major**) was growing along the roadsides in Missouri, Iowa, and Kansas. The yellow flowers resemble fall dandelions, but the long green bracts of the involucre immediately set the species apart. However, it was the amazing brownish sphere of fruits that really attracted our attention. On the greatly elongated beak of each fruit (achene) there was a delicate interlacing parachute forming an inverted umbrella. When we picked a fruiting head, the slightest tremor caused the parachutes to sail off, one or two at a time. On the right hand side in the photograph, enough of the fruits have bloom off to give a clear view of the delicate branched hairlike bristles of the parachute. This species of Goat's Beard is such a recent addition to our flora that nothing is known about its value as a honey plant. However, from the structure of the flower it seems certain that it will prove of value wherever it becomes numerous enough."



**Professor Lovell's son John, and his daughter Eleanor, share his interest in honey plants.**

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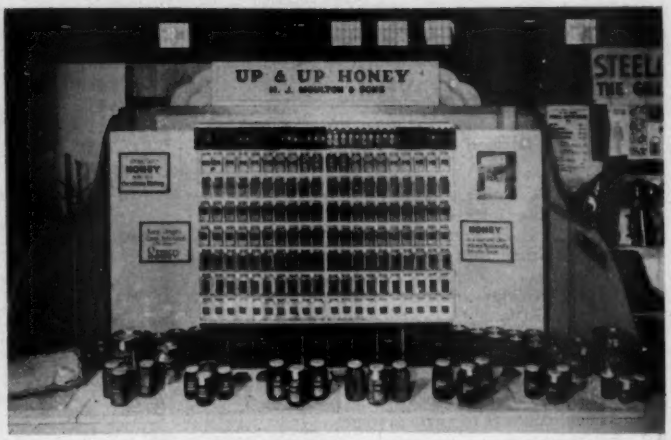
Dadant's for Honey Labels




H. J. Moulton, owner of the Up & Up Honey Company, of Portland, Oregon, sends this picture of the sales booth he and his sons set up at the Pacific International Livestock Exposition in Portland. On the right side of the display, notice the picture of their self-serve highway honey stand which helps bring them customers during the week spent at the Stock Show. Mr. Moulton thinks every effort should be made to induce honey producers to make more of these displays nationwide.

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# What's Going On

**Southern States Beekeeping Federation**
**December 3-4, 1951, Texas A. & M. College, College Station, Texas**
**PROGRAM**

8:30-9:00 — Registration.

9:00-9:15 — President's address — L. H. Little, Pres.

9:15-9:30 — A. W. Bulay — Cost of producing a pound of honey.

9:30-9:45 — Dr. A. H. Alex — Pollination experiments.

9:45-10:00 — Chas. Engle — Migratory problems.

10:00-10:15 — Raymond Fischer — Preparing honey for the market.

10:15-10:30 — F. E. Jackson — Packer-producer relationship.

10:30-10:45 — Dr. Warren Whitcomb, Jr. — Increasing bee production.

10:45-11:30 — PANEL DISCUSSION "Do we need price support?" — J. D. Beals, Will O. Victor, N. C. Jensen, Roy Weaver.

11:30-11:45 — E. C. Bessonet — Commentary.

11:45-12:00 — J. W. Newton — Do we need research on Nosema?

Recess for Lunch

1:30-1:45 — T. E. Burleson — Our responsibility towards the Institute.

1:45-2:15 — Mrs. Harriett M. Grace — American Honey Institute.

2:15-2:30 — L. A. M. Barnette — Problems of small beekeeper.

2:30-2:45 — Harvey York, Jr. — Chunk honey production.

2:45-3:00 — J. H. Davis — Control of bee diseases.

3:00-3:15 — Edwin Lott — What can a state do for beekeepers?

3:15-3:30 — Dr. F. L. Thomas — Can regulations be enforced?

3:30-3:45 — J. F. McVay — How honey producers can co-operate with A.B.B.A.

3:45-4:00 — Jas. I. Hambleton — Can beekeepers survive?

4:00 — Questions and answers from the floor under direction of Paul Cutts.

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**Middlesex County Beekeepers' Assoc.**
**Waltham, Mass., November 24**

The next regular indoor meeting is to be held at the Auditorium of the University of Massachusetts Experimental Field Station in Waltham on November 24, 1951 at 8 P.M. This is to be preceded by a buffet dinner in the adjacent Hall at 6:30. Lady members will furnish the food.

John H. Furber, Sec'y

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**Georgia Beekeepers' Assoc.**
**Annual Meeting**
**Tifton, November 13-14**

Georgia beekeepers will hold their annual meeting at Tifton on November 13 and 14, 1951. A good program is in the making and good attendance expected.

J. H. Girardeau, Jr., Sec'y

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**St. Clair Beekeepers Assoc., Belleville, Ill., November 7**

The regular monthly meeting of the association was held in the Highway Building at Belleville on October 3 at 8 p. m. Forty beekeepers were present. Carl Killion, Chief Apiary Inspector, spoke on inspection and showed colored slides. Registration of beekeepers and insecticides were discussed and Alan J. Dixon and Otis Miller, State Representatives, advised the group on legislation relative to the appropriation and registration.

The next meeting will be held November 7 at the same hour and place and plans for the state meeting will be discussed.

L. M. Leiper, Inspector
Program Committee

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**Westchester Co. Beekeepers Assoc.**
**New Rochelle, N. Y., November 18**

The regular monthly meeting of the Westchester County Beekeepers' Association will be held on Sunday, November 18, 1951 at 2:30 p. m. at the Odd Fellows Hall, 20 Lockwood Avenue, New Rochelle, N. Y.

The Annual Honey Exhibit will be held at this meeting and members are urged to bring their entries—there will be prizes for all honey types, as well as for beeswax.

Refreshments will be served after the meeting.

Bernadette F. Miller, Sec'y

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**Macon County Beekeepers' Assoc.**
**Decatur, Ill., November 18**

New officers of the association are: President, Ira J. Bowers; Vice-President, C. H. Cushman; Secretary-Treasurer, J. W. Head. The November meeting will be held at the home of C. H. Cushman, 1745 N. Church St., Decatur, Ill., on Sunday afternoon, November 18, at 3:30 P.M. There will be moving pictures and each member and visitor is asked to bring three questions for the question box.

J. W. Head, Sec'y.

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**Iowa State Beekeepers' Assoc.**
**Annual Meeting**
**Ames, November 14-15**

Annual meeting of the association will be held in Ames on November 14 and 15. A special program of entertainment is being provided for the evening of November 14. Members are urged to consider the banquet of the Horticulture Society which takes place on the evening of November 15. At this meeting awards will be given to members of the Horticultural Society including the Beekeepers Association. This will be an important meeting for the association and everyone interested in the development of the industry in the state is urged to be in attendance.

F. B. Paddock
Extension Apiarist

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**California State Beekeepers' Assoc.**

The annual meeting of the California State Beekeepers' Association will be held in Sacramento on December 5, 6, and 7, with the first session starting at 9:30 a.m. Headquarters and final arrangements will be announced by letter.

The program is being arranged to include topics on greater efficiency in beekeeping, reducing costs of production, honey marketing, honey processing, bee behavior, pollination problems, managing colonies for pollination, the California Honey Marketing Order, and related subjects.

Anyone interested in beekeeping or in pollination problems will be welcome.

A large attendance is expected.

J. E. Eckert, Apiculturist

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**Minnesota Beekeepers' Assoc.**
**Annual Meeting**
**St. Paul, December 4**

The annual meeting of the Minnesota Beekeepers' Association will be held in the St. Francis Hotel, St. Paul, on Tuesday, December 4. This year offers a condensed one-day program, closing with a banquet in the evening.

Clarence G. Langley, Sec'y.

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**Empire State Honey Producers' Assoc.**
**Annual Convention**
**Ithaca, N. Y., December 13-14**

The annual convention of the Empire State Honey Producers' Association will be held December 13 and 14 at Bibbins Hall, Ithaca, New York. The program has not been completed, but an interesting meeting is assured with some prominent out-of-state speakers.

Mrs. Edw. T. Cary, Sec'y.

(Please turn to next page)

### XIV International Congress
### Leamington Spa, England

The XIV International Beekeeping Congress was held at Leamington Spa, England, September 3-8, 1951. Situated right in the center of England, amid the beautiful trees and flowers of "leafy" Warwickshire, Leamington proved an excellent venue for the occasion. It was within easy reach of many places of historical interest like Stratford-on-Avon and Warwick Castle and an opportunity was provided to overseas visitors to do some sight-seeing in the neighborhood. The Mayor and Corporation of Leamington provided a very cordial welcome and put the Town Hall and Council Chambers at the disposal of the Congress. An organizing committee led by Dr. Barnes and Miss Ironside worked hard and are to be congratulated on the success of their arrangements. About 320 members attended the Congress and more than half were from outside Britain.

The Congress was the occasion of several important sectional meetings. The annual meeting of the Apis Club was held and a recommendation submitted by the directors that with the advent of the Bee Research Association and Apimondia the time had come to wind up the Apis Club. In view of the long and distinguished history of this Club several speakers expressed their regret at this proposal but the Directors were given a vote of confidence and authorized to proceed as they thought best. It was assumed that Apimondia would take over responsibility for the continued publication of The Bee World.

A meeting was also held to consider further the future of Apimondia. A simplified constitution was submitted for discussion. It was agreed almost unanimously that there is a need for an international organization in beekeeping, and that an effort should be made to continue The Bee World as an international magazine. If funds are available it is hoped to publish this magazine in three languages, English, French and German.

Other functions were held for the interest and entertainment of members. An afternoon was devoted to a visit to the Royal Agricultural College at Cirencester on the occasion of the Gloucestershire Beekeepers' Association's Field Day. The Warwickshire Beekeepers' Association held their Annual Honey Show during the Congress and this proved attractive and educative.

At the end of the Congress a large party set out for Buckfast Abbey where Brother Adam demonstrated his wonderful beekeeping set-up, without doubt one of the most attractive in the British Isles.

The social side of the Congress was not overlooked. One of the most popular items was the visit to the Shakespeare Memorial Theatre at Stratford-on-Avon for the play King Richard II.

J. N. Tennent, Scotland

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### Illinois Annual
### Springfield, Nov. 9-10

The annual convention of the Illinois State Association will be held in Springfield, Nov. 9-10, at the St. Nicholas Hotel. Details of the program are not available yet but there will be a banquet the evening of Nov. 9, with a mock radio show, prizes and surprises and lots of fun. Remember the dates, Nov. 9-10, Springfield, St. Nicholas Hotel.

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### Arkansas Beekeepers Assoc.
### Annual Meeting
### Little Rock, November 5-6

The annual meeting will be held at the Woman's City Club, Fourth and Scott Streets, Little Rock, on November 5 and 6. All beekeepers are invited to attend for food, fun, and the key to problems.

Apiary Board Bulletin

## The Insecticide Problem

Although in certain parts of the U. S.A. legislation has been enacted to control the application of insecticides harmful to honey bees, the American Bee Journal has held to the policy that for most a cooperative approach to the problem was wisest and best.

Word comes to us now from Arizona that not only has the extensive use of newer insecticides taken a terrible toll of bees which has resulted in a serious reduction in the honey crop, but has caused many people to suffer from bronchitis, asthma, and other respiratory illnesses. A petition signed by fifty South Phoenix residents, charging that the dusting is done without regard to residents dwelling in the area and is a menace to their health, has been filed with the state health department. The insecticides mentioned are parathion, benzylhexachloride (BHC), and DDT.

Arizona's approach to this problem, so far, is a cooperative one. The state health director is conferring with the Civil Aeronautics Administration concerning the practices of crop dusters and what restrictive measures can be adopted to remedy the situation. Also, the University of Arizona is attempting to establish a unified recommendation for the use and application of insecticides. But failing in a cooperative approach, Arizona is ready to seek legislative means to stop this threat to human health and beneficial insects.

The endangering of human health throws a much more serious aspect on the insecticide problem. If Arizona fails to achieve the necessary means to remedy this situation through cooperation, we heartily endorse a legislative approach to their problem.

# Bee Hives on BARGES!

To harvest Florida's famed Tupelo honey, many beekeepers use river barges in remote sections for transferring bee hives up and down the Apalachicola River, moving their colonies according to the season to get the fine flavor secreted by the gum tree blossom.

Uniquely favored by a mild climate and thousands of acres of clover and varied blossoms, Florida ranks fifth in the nation in number of bee colonies with over 218,000 colonies located throughout the state. Orange blossom, Palmetto-Gallberry and Tupelo accounted for a large portion of 15,620,000 pounds of honey produced in Florida last year.

It will pay you to find out more about Florida's future in bee cultivation. Write State of Florida for a beautifully illustrated booklet entitled "Farm Opportunities in Florida." Fill in and mail coupon today.

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# The Honey Marketing Problem

## by Roy A. Grout

BEEKEEPERS in many parts of the world are faced with a problem of selling their honey. **The Bee World,** in its September issue, started a series of articles on honey-marketing schemes being tried in Switzerland, West Germany, and Luxembourg, and plans to publish subsequent articles from other countries. **The American Bee Journal** thought it advisable to review this information for U. S. beekeepers, to add to it information about marketing in Canada, and to attempt to appraise these marketing schemes in relation to our own marketing problems.

### Switzerland

Alfred Lehman points out that the number of beekeepers in Switzerland is relatively large, there being about 8.4 beekeepers per 1,000 inhabitants. The average production per colony was reduced during the war years by an increase in agricultural production to 11 pounds per colony with an average crop about 7 pounds higher in the mountain meadows. From the results of 100 beekeepers' accounts from all over Switzerland, the cost of production in comparison to the amount received for honey is such that beekeeping cannot be considered as an occupation which, as a main line of business, will maintain beekeepers in security.

It is very difficult to keep the price of honey high due to imports from countries — mainly from Central America — where conditions for production are much better and costs are far below those of Swiss beekeepers. Although a substantial protective duty has been in force since 1921, it is not sufficient to maintain an equitable price for home-produced honey. Price disparities have existed for decades and it is impossible to compensate for them by raising the import duty.

The Swiss Beekeepers' Association has recognized that the best recommendation for their honey, and the most reliable way of maintaining price, lies in **quality production.** To solve this problem, the Swiss introduced the Honey Control system more than 50 years ago. The Honey Controllers, who are trustees of the Association, visit beekeepers and satisfy themselves that the apiary is in good order and the colonies healthy, that the extracting and honey storage equipment is clean and proper, and inspect and test the honey for quality. If approved, the beekeeper can obtain a supply of **Control labels** for use on his honey jars. Only home-produced honey can be marketed with the single descriptive word — honey; honey from abroad must bear the words — foreign honey, or indicate the country of origin.

Every beekeeper makes an effort to maintain an adequate economic price level, seriously concerns himself with the fight against abuses and dishonesty in the trade, and follows the instruction and advice of his association.

Switzerland cannot rely on the production of honey remaining the same every year. **Without an organization to regulate the honey market** in years of good harvest the surplus crop would depress the market, while in bad years honey would be scarce and dear in price — a situation that benefits neither the producer, the trade or the consumer. Thus, through cooperation between the Association and the large and wealthy agricultural cooperatives, an **Organization for the marketing of controlled Swiss honey** has been created. In good years, the cooperatives buy up to half of the controlled production, and either transfer it to districts with insufficient crops or store it until a bad year comes along. This equalizing procedure is designed to ensure an unbroken supply of Swiss honey for the market.

### Luxembourg

I. Hemes reports that the Grand Duchy of Luxembourg also has always had difficulty in marketing due to the competition of imported honey. However, they have succeeded in doing so by the creation of a National Mark system and, in 1948, the control of honey was organized on the same lines as in Switzerland, but administered through the Ministry of Agriculture.

The honey is judged by a committee of five for purity, cleanliness, aroma, taste and density, and all must be bottled in the standard jars prescribed by the Association, the beekeeper receiving the required number of labels of the Luxembourg National Mark Scheme. Those living distant from markets are able to dispose of their crops through the recently organized National Cooperative Sale Association which attempts to regulate the honey market in the Grand Duchy. Beekeepers attend training courses on the treatment of honey.

The beekeeper voluntarily puts himself under the official Control Board or joins the National Cooperative. The number of beekeepers doing this is increasing every year, and an effort is made to convince them that voluntary submission to regulation is to their advantage.

### West Germany

According to John Mentzer, beekeepers in the West German Federal Republic are organized in local, district and regional associations, and all are combined in the German Beekeepers Association (Deutscher Im-

kerbund, D. I. B.). The membership at present is about 189,000 representing 1,996,000 colonies; only a few beekeepers with an insignificant number of colonies remain outside the organization. The defeat of Germany resulted in the collapse of the organization which has begun reconstruction after the alteration of the currency in 1948.

After the war, to counter dishonest attempts to pass off to the consumer inferior or adulterated honey, the German Beekeepers' Association patented a standard glass jar and trademarked a guarantee seal which is broken when the container is opened. The seals are controlled by the associations and the beekeeper who uses them must keep a record of the quantity packed, and the recipient of the honey also must keep a record of the quantity received. Honey also can be sent to filling centers approved by the Association which furnishes lists of approved bottling plants to its members.

The standard jar has been well received by consumers, and the beekeeper makes sure only first-class honey is put into these containers. Testing the honey for quality by special control organizations — an expensive undertaking — has been held in reserve, because the supply of inferior honey can be traced back to the producer. Imported honey cannot be packed in the standard container.

The re-establishment of healthy marketing conditions still is hindered by the Korean situation and an accompanying sugar shortage. The price of many necessities of life are rising and unemployment remains high with the result that honey, which sells for about the same price as butter, is regarded as a luxury.

Sales pressure, therefore, has been required to sell honey. Posters of widely different kinds, concise informative pamphlets, extensive sales literature, and cinema and broadcast advertising see that a large public is continually aware of the value of honey. An increase in the sale of home and foreign honey appears quite possible if the danger of war lessens and if there is employment for the population.

### Canada

Through a one-fifth cent per pound universal container levy, the Canadian Beekeepers' Council launched an advertising campaign costing $23,000 in 1950. On December 1, 1949, Canada had 42 million pounds of honey on hand. During 1950 they sold 40 million pounds representing a per capita consumption of 3 pounds — the highest in the world. They engaged the services of Mrs. Harriett M. Grace and the American Honey Institute which supplied news releases and promotional aids. Further, they urged every beekeeper to get out and help by creating new customers and doing more to sell a share of the honey crop. The market now is well cleaned of honey and ready to receive the 1951 crop.

J. N. Dyment, president of the Council, stated, "We can all say, quite definitely, that the one-fifth cent per pound levy paid by the beekeeper has been multiplied many times to his own benefit. It is an investment in his own business which is paying greater dividends than most speculative stocks."

### Summary and Comments

It is exceedingly difficult, if not impossible, to appraise and to compare these marketing programs. The size of these countries, their density of population, and the extent of beekeeper organization varies greatly. Switzerland is about half the size of South Carolina in area but her population is more than twice as great. Luxembourg is smaller than Rhode Island in area and only has about one-third the population. West Germany is about the size of Minnesota or Utah in area but its population is more than twice that of New York State. Canada is only slightly larger than the United States in area but its population is less than one-tenth that of ours.

Considering Switzerland, Luxembourg and West Germany, it can be stated generally that they are small countries with dense populations, and with beekeepers organized to a much greater extent than in the U. S. Competition of imported honey, relatively low average honey production, high costs of production, and greater economic stress have resulted in marketing programs and controls far beyond anything we have in this country.

There are several things common to each of their marketing programs. Each stresses quality production whether controlled or voluntary. Each uses a standard container and a controlled label which readily identifies the honey to the consumer as of high quality and home produced. All stress education of the public that honey is a food of value. Each stresses an intensive marketing program with prices maintained at an equitable level.

Canada, our friendly neighbor on this continent, probably compares more closely to the U. S. although its population is much more sparse. Canada increased its per capita consumption of honey by one pound. We commend her for this accomplishment. Were the United States to increase its per capita consumption by even a few tenths of a pound, we would consume our entire honey crop. **Canada, through advertising, promotional agencies, and an extended marketing program, was able to solve her own problems.**

We have been told in the U. S. A. that a universal levy on containers was not legal, and funds for a marketing program, voluntary or otherwise, have not been forthcoming in sufficient amount.

Advertising has its place. We heartily endorse private brand advertising spiced for consumer appeal by the individual twists given it by merchandisers. We admit that national advertising would be of great help but we question its practicality. Advertising must be a continuing program; its costs are phenominal. Do we have enough honey to justify national advertising? Are we financially able to compete with such products as breakfast foods, cake mixes, cigarettes or condensed milk?

We have had the promotional agency — the American Honey Institute — for many years. We only have praise for the Institute. Where would we be today if we had not had this agency for some twenty-odd years? Its ability to serve is handicapped only by the extent of support given it.

The promotional helps and advertising create a demand for honey. It takes an intense and active marketing program involving packers, beekeepers and their wives to finish the job and sell the honey! Doesn't our major trouble lie in the fact that we have failed to create an adequate marketing program?

We have fallen down seriously here. We have not given sufficient stress to marketing only the finest quality honey. As individuals we do little or nothing to educate the consuming public; we do little or nothing to promote the use of honey on the American table. Those not equipped for or suited to the task of selling honey make but a feeble effort to sell their crop at an equitable price. We are too prone to sit and wait for some buyer to come upon the scene, usually buying honey at a low price. And too often, these same

(Please turn to Page 489)

# Bees Go to School

## by Mrs. Genevieve Robinson

Left to right: Marlene Dorn, Nancy Wilcox, Vicki Orton and Delores Lorenzen point out facts and questions about bees.

Parents Mrs. Charles A. Hutchins, Chester L. Glenn, and Mrs. C. J. Strand watch the bees in the observation hive.

The bee dance as interpreted by Caroline Strand, Judith Caldwell, and Bette Hopkins.

FOURTH year children in the Washington School in Billings, Montana, have been "busy as bees in a beehive" collecting information about the honey bee. Through reading, pictures, an observation hive, beekeeping equipment and collecting things made of beeswax they have added much to their knowledge of bees.

Visiting parents were equally fascinated when they saw a real beehive and learned the usefulness of the honey bee.

Each of the 37 children in the author's room had a definite part in presenting the information. From a large drawing made by one of the pupils, the anatomy of the bee was described. The difference between queen, worker and drone was explained as well as the duties of each. With the use of pictures and the observation hive the development of the bee from egg to adult was shown.

Next the children learned how nectar was obtained and changed to honey. As part of the program for parents, three girls presented a "bee dance," which they originated from study of the bee's habits. Other children produced sound effects with the dance.

One child described the gathering and storing of pollen, while another demonstrated with pictures the wax glands of the workers and how they store wax. On display were cosmetics, candles, honeycomb and other articles illustrating the uses of beeswax.

Swarming pictures were shown to illustrate the way bees swarm and how swarms may be hived. One

*It is not likely that any of the children who took part in this project will soon forget the story of the honey bee, her usefulness and her products. Information which is presented as vividly as this leaves a lasting impression on students and parents as well. It would be a fine thing if more of this sort of education about the honey bee could be carried on in all our schools. Mrs. Robinson is to be commended for a fine piece of teaching.*

Ed.

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pupil showed how to take out the stinger if a bee stings. The uses of the smoker, bee veil and gloves were shown by the children as they demonstrated the parts of a beehive. A skep hive was shown and described as one of the crude hives still used in some countries. Other equipment demonstrated included an uncapping knife and pictures of extractors.

Statistics on the kinds and amounts of honey were given and the children learned the value of fractions in arithmetic by using honey recipes.

Pollination was shown to be the greatest value of the honey bee to man. History also had its place in the program, as a student showed on a world map the migration of the honey bee with the white man. Ancestry and present races of the bee were discussed, and a student read the portion of Longfellow's "Hiawatha" in which the Indian warrior calls the bee the "Ahmo" or white man's fly. Enemies and diseases of bees were also discussed.

During the program a "Magnetic Stage Act" created interest. Two girls made a puppet stage with artificial flowers and a paper beehive in opposite corners. As the children sang "Busy Bee," little paper bees fastened to paper clips flew back and forth by means of a hidden magnet backstage.

The fourth grade room was decorated with pictures of bees and flowers drawn with pastels. The children had decorated eggs to resemble bees and invitations to the program were made in the shape of a skep.

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**Robert McCann and Brenda Tronson demonstrate the many uses of beeswax.**

**Gary Hess and Van Hager appear in all the beekeeper's paraphernalia.**

**The skep hive still used in some foreign countries is shown by Larry Wilson.**
(Photos by Robert Hamilton, Visual Aids Director, Billings City Schools.)

# Alfalfa Seed Production

by Edw. A. Wolfe

THE use of honey bees as pollinators of alfalfa is beginning to be part of our agricultural practice—thanks to the promotion of a few energetic and foresighted men in our industry. But contrary to the belief of many—beekeepers and seed producers alike—the problem of seed production is not yet solved. Many farmers believe they are highly progressive since they are using honey bees and that there is little more to do. And some beekeepers think that with their participation success is practically assured. In other words, put an alfalfa field and bees together and the seed is practically in the bag. This would be an ideal situation if true, but in terms of complete success, it is not true. Pollination is an important part of seed production, but at best only a part.

Several factors are recognized in the process of seed production. It is likely that time, observation, and experimentation will reveal others. Where a full effort has been made to produce alfalfa seed, results have generally been gratifying. Seed yields under these conditions have been approximately double the average for the area involved, and many fields have shown increases of 500 per cent or more.

Factors having an influence on seed production over which we have some control are:

### Varieties

Seed of recommended varieties must be increased. Ranger is favored in many areas because of its wilt-resisting characteristic and Buffalo is produced to considerable extent. Constant efforts are being made to develop superior varieties. Regardless of the strain, the seed must meet requirements for certification if at all possible, and it is better if the seed will meet registered or foundation requirements.

### Management of the Field

In the Midwest, it has been considered advisable to bring the alfalfa plant into bloom during the warm and dry part of the summer. The advantages of such practice are heavier bloom, more favorable insect action, less rain damage, and less regrowth. However, in some areas, there has been a tendency the past two or three years to use more first crop alfalfa for seed production. The stimulation of this practice may be due to results that were as good or better than those of the subsequent crop. There is some indication that honey bees are more effective at the earlier date due to the demand for pollen and nectar, and the absence of many competing blossoms which are present later. Fields should be selected that can be kept free of weeds, especially noxious ones.

### Control of Grasshoppers

This problem may grow to serious proportions in some areas. Grasshopper control may be difficult if the surrounding area is heavily infested. It is more effective if control measures are taken while the insects are still confined to comparatively small areas. Toxaphene has been used successfully as well as other insecticides. Recommendations for each area should be followed rather than accepting a standard rule.

### Control of Other Injurious Insects

Lygus bugs, web worms, and other harmful insects are found throughout alfalfa areas. Their damage is greater than is suspected. This damage is serious from a forage production basis, and even more serious from a seed production standpoint. Insect population in the field should be under constant observation. DDT has probably been most commonly used for control, but other insecticides are effective. Recommendations of local authorities should be followed.

Extreme caution should be exercised in the use of any of the insecticides since they are also deadly to the honey bee. It may be necessary to spray or dust during the early plant growth stage if the presence of injurious insects justifies it. Most seed producing fields are sprayed at the pre-bloom stage. Application of the insecticide at this time tends to control the harmful insects through the seed producing period but does not affect honey bees moved in later. If conditions make it necessary to spray the field in bloom, it should be done between 7 p. m. and 7 a. m., or on days when weather prevents insect activity.

### Conservation of Moisture

This should be practiced to assure adequate plant growth. Where irrigation water is available, this

may not be a serious problem. If soil moisture is seriously depleted and there is little prospect of precipitation in substantial amounts, attempts to produce seed may fail. Weeds should be eliminated because of their competition for moisture.

**Staggering of Cuttings**

There are several advantages to this policy. It gives both the native and the honey bees a longer pollinating season. It permits smaller numbers of honey bees to pollinate a larger area. It doubles or triples the chances of having a seed crop develop during the most ideal, climatic conditions; and it allows the seed to mature on a staggered basis so that the entire field will not need to be harvested at once. Attempts to harvest large acreages frequently are disrupted by weather conditions. A delay at this stage of production may seriously reduce the crop. Staggering can be accomplished by cutting one-third of the field when blossoms first start to appear; another third ten days later, and the final portion ten days later than the second. However, this plan is not entirely advantageous. One of the more serious disadvantages is that insect control seems more difficult to maintain under these conditions.

**Management of the Stand**

Proper management of the alfalfa field allows the plant roots to go into the winter with ample food reserves. To provide this condition it is necessary to avoid late cutting or overgrazing. Plans for the legume seed crop must start months before the growing season. Plant population considered desirable is highly variable depending upon normal conditions for each individual area.

**Use of Fertilizers**

Fertilize as needed or recommended for the field in question. On light texture soils under irrigation, the application of phosphate may often pay good dividends. Applications of lime may be beneficial. Reliable soil analysis will indicate the kinds and amounts of fertilizers that are needed.

**Pollination**

Pollination of the blossoms must take place before a satisfactory seed crop can be produced. Native bees should be given every opportunity to increase in numbers.

Honey bees are the most reliable source of pollination. Recommendations for numbers to be used vary. Generally, a minimum of two colonies per acre is considered proper. Various factors should be considered before deciding the number of colonies. In some areas, seven colonies per acre are considered beneficial and profitable. It is recommended by some that the bees be scattered throughout the field in units of not more than ten colonies. Some move these colonies to different locations in the field every few days during the pollinating season. No general recommendation is made for determination of the share of the seed crop which the beekeeper should receive, or cash rental value. The level of seed production varies so much from one locality to another that it would be difficult to develop recommendations applicable to all.

**Harvesting**

We are not well equipped for the final phase—harvesting. Obviously, the intelligent operation of available machinery should be given high priority. It has been said that we have no machines that will do an efficient job of harvesting legume seed. Reports of machine losses as high as 50 per cent are not uncommon. There are several methods of harvesting but the practice of mowing, swathing or windrowing, and pickup combine harvesting seems most common and probably most efficient, although there is room for improvement. Defoliates may solve part of the trouble.

Although about two-thirds of our alfalfa is grown north of the Nebraska-Kansas line, approximately two-thirds of our alfalfa seed is produced south of that line. Most legume seeds are still comparatively scarce and high in price. Farm crop rotations demand a considerable amount of seed annually. Good pastures and high quality forage are not plentiful. According to R. E. Hodgson of the Bureau of Dairy Industry, U. S. D. A., if we fed enough good quality roughage, we could produce as much milk as we do now without feeding a bushel of grain. Our efforts at soil conservation and soil reclamation are far from ended, and the demand for quality legume seed will continue.

The problem of alfalfa seed production is not easy to solve. It requires the intelligent cooperation of all concerned. Efficiency is not a matter of luck. Luck is a thing that happens when preparation meets with opportunity.

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## Objections to New Oregon Law . . .

It appears that the new Oregon bee law has a provision in it that a minimum of 25 cents per hive is to be charged for inspection and permit to move bees in the state. There is some question in the first place whether this does not mean a charge of 25 cents for the hive, plus a charge for supers, and, of course, it does mean that every time a move is made, a 25 cent charge is instituted. Where three or four moves are made in one season, back and forth, this could take all of the profit out of an operation.

We understand that suit has been filed to clarify the law and particularly show up the fact that many Oregon bees are used for the production of honey only and the margin of return in such cases is inclined to be quite low.

## More von Frisch Studies . . .

March 1951 number of "The Bulletin Of Animal Behavior" (British) devotes the first 33 pages to translations by Dr. D. Ilse of Karl Von Frisch's articles: I. Solved and Unsolved Problems of the Bee Language, II. The Polarization of Light from the Sky as an Orientating Factor in the Dances of the Honey Bee, and III. The Sun as a Compass in the Life of Honey Bees. These papers first appeared in "Die Naturwissenschaften" and "Experimentia." The first paper is complete; the others summarized.

While much of this material is already available to American readers in the book by Von Frisch recently reviewed in these columns and published by the Cornell University Press, there are additional findings included in the present translations from the original.

We can but applaud the work of Karl Von Frisch. As one American student of bee behavior said, "It just cannot be true but Von Frisch definitely proves that it is." His trials and results with combs in normal position and the indication of distance by the dances as well as indication of direction are well nigh uncanny. So is also the fact that the honey bee is oriented by polarized light in her various dances.

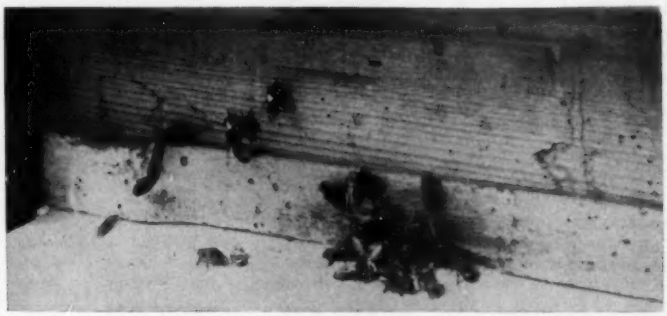
We recommend the present article where available, and, the Von Frisch book (in English) which can be ordered from the American Bee Journal office at a postpaid price of $3.00.

# New Insecticides are Disastrous to Bees

by Dr. E. E. Leppik

Professor E. Leppik (left) and Instructor O. Palm (right) of Augustana College, Sioux Falls, S. Dakota, first observed the transfer of poison by bees and explained the phenomenon of the "Bee's-Struggle" by this experiment.

1. Ten test-bees out of a bee-colony kept for experiments are at first well fed and then marked with a white spot and placed in a test-cage where they get contact with flowers powdered in the usual way with a strong acting nervous poison. After some minutes, these poisoned bees are allowed to return to their home hive.



2. The returning ten poisoned bees are allowed by the sentries to pass without raising suspicion; the hive is still quiet and a few bees are seen at the entrance only.

DURING World War II, a number of new phosphoric compounds were discovered in Germany. Some of these derivatives delivered later excellent insecticides, such as Thiophos, Parathion, E-605, Folidol, Metacide, Potasan, Systox, and others. These new insecticides are as effective against injurious insects as they are dangerous to the bees and all useful insects. A great many serious poisonings of bees have been reported from every country where these insecticides have been used.

The author of this article has had the opportunity to develop extensive experiments and research work with these new substances. From the standpoint of apiculture the following two observations are highly remarkable and may be of great practical importance for the beekeeper: **1. Continuous chainlike transferring of poison from one insect to another and 2. The excitement and confusion of an entire bee colony on account of a few poisoned bees, the phenomenon being called "Bee's Struggle."**

### The Transferring of Poison from one Insect to Another

The fact that bees transfer poison from one bee to another was first observed in nature and later established by several experiments. Ten bees which came into contact with flowers treated with E-605 were able to poison up to 1000 other bees, and to destroy the whole bee colony. The poison was distributed in the hive like a "chain reaction" from one bee to another. The transferring of poison from one insect to another could also be observed in wasps, bumble bees and tropholiactic ants.

From a practical point of view, the transferring ability of some nerve poisons gives an opportunity to develop highly active insecticides against wasp and ants but makes these insecticides very dangerous to the bees.

### "Bee's Struggle"

In some places of Bavaria, where the new insecticides on the basis of E-605 were used, beekeepers made a peculiar observation. In some hives the bees suddenly became very excited, started to kill each other and stung everybody who came near the

hive. The beekeepers called this phenomenon simply "Bee's Struggle."

Later "Bee's Struggle" has been demonstrated experimentally, using nerve poisons. Ten bees were marked with white spots (fig. 1) and permitted to suck the nectar from the flowers treated with nerve poison. The poisoned bees returned to their hive whereas the guard bees made no effort to stop them from passing through.

Nevertheless, the poisoned bees are soon identified as a great danger to the whole hive. They are angrily attacked by their fellow bees, driven out of the hive and killed. But the chainlike distribution of poison from one bee to another has already started in the hive and more and more bees are poisoned. As the number of poisoned bees grows rapidly, severe fighting starts between the poisoned and unpoisoned bees and the whole hive is mobilized to combat the poisoned bees. The whole colony is very excited and a great number of irritated bees are nervously flying around the hive stinging everyone who tries to approach it. The entrance into the hive is blocked and no bees are allowed to enter. (fig. 3) One time even the queen bee was killed.

The struggle continues until all poisoned bees are driven out and killed or until the greater part of the bees are infected by the transferred poison. After each "Struggle" the area surrounding the beehive is covered with dead bees.

3. After only half an hour furious attacks and actions are already in course. A large number of bees have gathered in highest excitement at the entrance and on the starting platform of the hive. In the foreground several still sound bees have surrounded the poisoned and marked bees and are just about killing them.

4. In the evening of the first fighting day, the floor of the test-cage is already thickly covered with dead bees.

DDT and BHC are not able to provoke the "Bee's Struggle."

### What the Bees Are Fighting For

This "Bee's Struggle" cannot be considered as a fight of single individuals with one another from a human standpoint, as not the least attention is paid to the death of single individuals in the hive, but the above described appearance is in full accord with the instincts of the bees as a desperate struggle for the existence of their species as can also be observed when epidemic diseases are spreading in a beehive, even if not to the same extent and violence as in the case of the "Bee's Struggle." This is a counteraction based upon the natural instincts for saving the species as a whole in extraordinary cases by the eradication of a certain portion. The "Bee's Struggle" is a natural reaction against the synthetical substances of an unnatural strong effect on the life of insects.

### 2, 4-D Poisonous to Bees

It was further established that the herbicide 2, 4- dichlorophenoxyacetic acid, although on the basis of hormone, is poisonous to bees, but it acts slowly and takes several days until the symptoms of poisoning appear. Death follows after 5 to 7 days. Extensive poisoning of bees took place, if the 2, 4-D herbicide was used for treating blossoming weed.

During the summer of 1950, extensive poisoning of bees with 2, 4-D has been reported from Sweden and Denmark, where the mustard and dandelion plants have been treated.

### Conclusion

These experiments point clearly to a new threat to bees and other useful insects. There is a good scientific basis to develop a highly effective chemical weapon against noxious insects. But every improper mass use of these fatal nerve poisons can lead to unpredictable catastrophies in agriculture and horticulture. The bee is not the single useful insect which is necessary for horticulture and agriculture. Bees are, however, entirely under human control. They can easily be protected against insecticides and reproduced at any rate. But there are a great number of insects which are absolutely necessary as pollinators, partakers in the biological process formation of humus, or carriers of biological equilibrium in nature. These insects are unprotected against fatal nerve poisons.

# Care and Storage of Supers with Combs

## by Roy A. Grout

THE supers of empty combs usually are moved from the extracting space to a place in the honey house where they are stored until they are returned to the colonies. If they will be needed soon for additional storage of honey, or if it is the practice of the beekeeper to return the supers of empty combs to the colonies for the bees to dry them of all remaining honey, they should be stored near the truck driveway where they can be readily accessible. If it is the practice of the beekeeper to store empty supers of combs that are still wet with honey and if they are no longer needed for additional storage of honey that season, the supers should be taken to the permanent storage space.

Many prefer to return the wet supers to the bees to clean or dry them of the adhering honey. When disease is prevalent in the neighborhood, it is advisable to return the same supers and combs to the colony from which they were taken. Drying the combs eliminates the probability of the remaining honey granulating in the combs where it is either wasted by the bees the following season or remains in the combs and is extracted with the next season's crop, inducing granulation more readily. It also is contended that when dry supers are returned to the bees the following year, they are not conducive to robbing to the extent that occurs when wet supers are taken into the yards.

To eliminate the additional work and care in handling super combs in order to return them to the colonies from which they were taken, some beekeepers stack the supers high over a few colonies, have arrangements whereby a single colony may have access for cleaning a number of stacks of supers, or they may stack the supers in the open at a distance from a number of colonies. In all these methods the possibility of spreading disease is present.

The permanent storage space for supers of combs should be large enough to contain at least four supers per colony operated. Compared to the extracting space or other parts of the honey house it should be much larger, for into it must be placed all the supers and it may serve also as a workshop where supers are painted and repaired. Except in northern states where protecting stored combs is not as great a problem, it is necessary to fumigate the stored combs from time to time to prevent damage by larvae of the wax moth. Thus the empty super storage space should be suitable for the proper fumigation of combs, and should be mouseproof and bee tight.

The empty supers should be stacked tightly together and covered in a way which will prevent the entrance of the wax moth at all times. It is recommended that the cracks between the supers be covered with gummed paper tape to make the stack as nearly gas tight as possible. When gases heavier than air are used, such as that given off by paradichlorobenzene, it is important that the bottom of the stack be closed tightly and the reverse is true of gases lighter than air. Whitcomb summarizes information on fumigating stored combs against wax moth, based on a stack of five standard ten-frame supers as follows:

| Fumigant | Characteristics of the gas | Quantity to be used | Length of treatment | Remarks |
|---|---|---|---|---|
| Paradichlorobenzene | Nonpoisonous to humans, noninflammable, nonexplosive. | 3 ounces or 6 tablespoonfuls. | Keep supply in stack throughout storage period. | Inspect supers at 2-to 3 week intervals. |
| Carbon disulphide | Poisonous to humans, highly inflammable, highly explosive. | 1 ounce or 2 tablespoonfuls. | Not less than 12 hours. | Repeat once after 2 or 3 weeks. |
| Sulphur | Irritating | 2 ounces | Not less than 12 hours. | Repeat once after 2 or 3 weeks. |
| Calcium Cyanide | Extremely poisonous to humans, noninflammable, nonexplosive. | ½ ounce or 1 tablespoonful. | Not less than 12 hours. | Repeat once after 2 or 3 weeks. |
| Carbon tetrachloride | Poisonous to humans, noninflammable, nonexplosive. | 1 ounce or 2 tablespoonfuls. | Not less than 12 hours. | Repeat once after 2 or 3 weeks. |

In order to fumigate stored empty supers, airtight rooms have been constructed in honey houses and some have even installed methods of ventilating these rooms before entering them when dangerous fumigants were used. It should be remembered that it is very difficult, expensive, and practically impossible to construct an airtight room. When dangerous fumigants are used they are apt to seep from the super storage room into other parts of the honey house over periods of time. There have been a number of deaths reported when cyanide was used inside the honey house, and there have been fires when carbon disulphide was used.

Because of the danger involved in using cyanide in the honey house, the fumigation of stored combs should be done in a separate building or outdoors. In either case the supers may be stacked on 2-inch boards permitting the cyanide to be introduced underneath the stacks of supers. The supers should be stacked as tightly as possible, the cracks between supers closed, and the stack covered at the top. If in a separate building that is sufficiently airtight, the supers can be crisscrossed and the entire building fumigated.

**A gas mask should be worn whenever the beekeeper enters the build-**

ing and extreme care taken to prevent the entrance of any individual through innocence or intent. A platform for storage of supers outside the honey house provides for their fumigation and results in the requirement of much less space in the honey house, and a reduction of loss in case of fire. When the supers are stored on platforms in the bee yard they are available in the spring when it is often difficult to truck them to the yards because of muddy roads. Cale described the wood platform or floor which is constructed for out-of-door storage, on which the empty supers are tightly stacked on 2-inch boards for drying and later fumigated and covered.

(From "The Hive and the Honeybee," 1946 ed.)

# Flight in the Wintertime

## by Hoosier Pete

THE Canadians have been mechanizing very fast since the end of World War II. "Country Guide," Winnipeg, tells of an unusual farmer of Dugald, Manitoba. The name of this man with new ideas is Vernon Briercliffe, and along with unusual farming operations, he combines soil conservation and beekeeping. Mr. Briercliffe will have about 150 hives of bees ready to set out of his bee cellar this spring.

When cold weather arrives with winter the bees are carried to a cellar built for the purpose. This enclosure goes four feet underground, and the top four feet above ground is banked up with dirt. Air enters the cellar through an underground pipe, and the top is insulated with wood shavings. With no artificial heat the air is kept above freezing, keeping the bees comfortably warm, about 40 degrees. The bees are fed 18 pounds of sugar sirup, 50-50. The colonies are examined every two weeks, not disturbing the cluster.

Many authorities in Canada believe that a winter flight is of benefit to good wintering. This has nothing to do with the Bible injunction that "man should pray that his flight be not in the winter," as honey bees are different. Briercliffe believes that it would be a help to make the bees break cluster about the end of February. He has tried breaking and not breaking clusters until he is satisfied that it is of great benefit. His procedure is to place the hive in a dark room, and then to alternately turn on 500-watt lights at each end of the room. The plan is to so arrange it that just as the bees reach a lamp at one end of the room it goes off and the other comes on. In this manner the bees are caused to fly rapidly from one lamp to the other. Eliminating excreta on the wing leads to healthier bees, so Mr. Briercliffe gives a three-minute flight, after which bright lights are used to cause the bees to enter the hive again.

While the bees are flying the combs are checked for disease, and arranged with three empty combs in the center, two combs of pollen on either side, honey filling the remainder of the space. When the bees are returned to the cellar they are given a feeder filled with pollen and water, with the result that the bees do not cluster again and brooding begins. The colonies are set out in the open fields about mid-April.

The farm of Mr. Briercliffe is supplied with many plants useful to bees, and the attempt is made to supply nectar over a long period. Pussy-willows give the first pollen on this farm, followed by dandelions and white Dutch clover. Then comes yellow clover, golden honey plant, and giant sweet clover of the white variety. Later comes Pellett clover, alsike, crimson clover and alfalfa. Hubam supplies fall nectar. Many honey plants have been introduced on this Canadian farm by Mr. Briercliffe himself, and his terrific bent for experimenting leads him to look for additional honey plants constantly. Soon he will have 36 varieties of clover, four kinds of alfalfa, in addition to many more plants. He has plants from the U. S. A., Switzerland, England and other points. He especially recommends Hubam because it extends the nectar season up to freezing weather.

Last season Briercliffe was anxious to cash in on the favorable price of alfalfa seed, 43 cents per pound in Canada. He took 500 pounds of honey from uncapped combs, mixed it with 125 pounds water, added three per cent of sizing glue, and sprayed the mixture by power on ten acres of alfalfa. He reports that he got a very favorable setting of seed as a result of this experiment, saying that he feels sure his departure resulted in quite a profit.

It is said that Briercliffe is a "crank" on record keeping, so he always knows how his experiments turn out. Half the practices on his farm are inventions or ideas developed right at that point. This Canadian says that his records show that his method of causing the bees to break cluster in February has resulted in 40 pounds more honey from each wintered colony.

American apiarists might be inclined to jump to the conclusion that Briercliffe goes to a lot of extra work in order to carry some of his experiments through. However, in appraising the results we should take into consideration that Canadian winters are usually long and very cold. Briercliffe has kept bees for 23 years, so he should be able to judge results with more reliability than if he were a beginner, on an average. He states quite emphatically that his breaking of the bee clusters in February not only assures him 40 pounds more honey per wintered colony; but also, that the practice benefits him in another way in that his outlay for package bees is reduced, with more profit to him.

My experience shows that most bees in the U. S. A. are lost after the month of January, due to weaker colonies and dwindling stores in the latter part of winter. Briercliffe has worked out a method suitable for bees in his cold climate, but some of his practice is adaptable farther south. His method of feeding the pollen with water is worth consideration, since I recall Langstroth remarked in his early book that he considered water and pollen substitute important. Langstroth often obtained brood with water alone.

With the whole world apparently moving to fresh practices in all lines, Americans should not be content with orthodox procedure, but consider all new experiments in the light of what they may be worth under changed world conditions. Many are of the opinion that heated hives are here to stay, in one form or another. Many practices of today may become obsolete in a new era. Indiana

# Depreciation Accounting for Beekeepers

by Bernard A. Chandler

THE beekeeper's greatest investment is in his plant and equipment. He should keep good plant and equipment accounts in order that he may know the amount of his investment at all times and be able to compute his depreciation expense as accurately as possible. He has his choice of three general methods of keeping his accounts; by single items; by year's purchases; and by the composite rate method.

### Three Methods

Accounting for depreciation by single item accounts appeals to many people because it seems to them to be more accurate and easy to understand. In fact it is not, because it attempts to do some things which cannot be done. It is possible to determine the average life of a given class of equipment with a reasonable degree of accuracy, but it is not possible to determine or guess the probable life of single units. Some extracting frames last for twenty years and others are broken within the first year, but none of us can look at a hundred frames and pick out the ones which will be retired before their average life and those which will still be in use after some of us are dead. An average life used to compute depreciation on a single item is meaningless because it is no measure of the expected life of that unit. Even if single item accounting did accomplish what its advocates claim for it, it is too expensive for our purposes.

The practice of writing off each year's expenditures for equipment over a given number of years is very common but it has little to recommend it. The number of years over which each year's purchases are written off need not have any and usually has only a very general relationship to the average life of the assets. It is not a system of depreciation but an amortization of year's purchases. If the year's purchases were of equal amounts each year it would make no difference whether one, two, or ten years were used. A depreciation charge computed by this method reflects a reasonable charge to expense only because it spreads the unevenness of the annual expenditure for equipment over a period of years. According to this method, equipment purchases are written off until fully depreciated, regardless of actual retirement of the unit involved. Although still used by many industrial businesses this method has been abandoned by nearly all public utilities because it failed to give the information desired, and involved too much computing.

The so-called composite rate method is more simple and at the same time more accurate. Depreciation for any period is computed by multiplying the rates by the average investment for the period. The rate is based on the average life of the equipment actually in service and the estimated salvage to be realized from its sale when retired. If the period is for a year the annual rate is used, but if depreciation is computed by the month the rate used is one-twelfth the annual rate. The depreciation is accrued in a reserve account and the reserve account is very important because the ratio of it to the plant account is the barometer of the whole system.

### Accounting Procedures

The total investment in equipment may be carried in one account or in several classified accounts. For small operations one account is probably best. The large operator may desire more detailed information. If classified accounts are used the classification should be in accordance with functional use. The accounts may be classified into: Bee Yard Equipment, Extracting Equipment and Miscellaneous Equipment, or each of these may be subdivided. The final classification may get down to such items as Standard Hive Bodies and Bottom Boards, but the fallacy of making the primary classification along that line is seen when a business which is producing queens, package bees and honey is considered. If cost accounting is one of the objectives of the system, the classifications must follow operating functions. The classification should be kept as simple as possible.

It is best to have a depreciation reserve account corresponding to each equipment account although it is not absolutely essential. It is possible to have one depreciation reserve account for the whole plant but reserves so accrued do not serve their full function as barometers.

All purchases are debited to the proper equipment account regardless of whether they are replacements or additions. Large units such as extractors should also be recorded on a card index. Small units used in large numbers should be recorded on special memorandum accounts. The reason for these supplemental records will be evident.

Retirements are credited to the proper equipment accounts and debited to the corresponding reserve accounts at original cost. The small operator can usually look back in his ledgers and find the original record when large units were purchased. The cost of small units may be estimated by the use of some old catalogs of bee equipment. The large operator should keep supplemental records to aid in pricing of retirements. A card index should be maintained for large units showing type of equipment, number of unit, date of purchase and cost. For the small units in which the investment is large because of their large numbers a perpetual inventory memorandum should be maintained showing at all times the number of units in service

and the total accumulated cost. Retirements should be priced at the average cost as indicated by those data. The maintaining of such a record in connection with purchases is not difficult. It may be kept on an analysis sheet behind the ledger account. The cost of other items which do not fall into either of these two classifications may be estimated with sufficient accuracy.

Salvage will not be a big factor for the beekeeper, but if salvage is realized from the sale of ordinary retirements it should be credited to the reserve.

In big businesses the determination of the average life of different units is a big job. It is determined by an analysis of actual retirement dates when such data is available. The beekeeper need not worry about such methods. Ten per cent is usually considered reasonable for beekeeping equipment. If accounts are properly set up using ten per cent and the reserve ratios are carefully watched it can be determined if the rate is very far out of line.

The reserve ratio is the ratio of the reserve to the capital account. The normal ratio is that of a plant which is old enough to have "reached its gait," is being currently replaced, and is being depreciated at its average life rate. Such a normal ratio cannot exceed 50 per cent. In plants where there is a high salvage and rapid growth it may be as low as 20 per cent. For an old bee yard for which accounts are being set up the reserve ratio should be about 40 per cent. For a new bee yard which is being expanded rapidly the reserve ratio would be very low at first and should gradually increase to about 30 per cent. When increase is discontinued the reserve ratio will gradually increase to 40 per cent or possibly even higher. If it tends to go over 50 per cent it indicates that the rate is too high or that replacements are being deferred.

The question of foundation requires a little special consideration. The foundation used in the production of section comb honey should be charged direct to the cost of production. The foundation for the brood nest and extracting frames should be capitalized as part of the cost of producing combs. If an account is kept for combs the cost of frames and foundation should both be charged to it. When the combs are melted down and the frames refilled with foundation there are two or three ways to record the facts. The foundation used may be charged direct to cost of production as a replacement. This is probably the most simple but it follows a practice which has been tried in big business and found unsatisfactory.

The correct way is to handle the combs melted as retirements and credit the equipment account and debit the reserve with the cost of the foundation. By this method the heavy foundation used is all capitalized.

The reader who has been keeping bees for some time and has a lot of old equipment but has never kept adequate accounts is probably wondering how to proceed to set up his accounts for this old equipment. The best plan is to make an inventory of the equipment noting its condition. This inventory should be priced at cost new and this cost set up in the equipment accounts. A reserve should be set up representing the expired life as indicated by its condition. The difference between cost and the reserve is the sound cost of the equipment. If second-hand equipment is purchased it should be set up in the capital account at what would have been its cost when new and the amount by which that cost exceeds the purchase price should be set up in the reserve. The principle that actual cost should be recorded is met, as it is the difference between the original cost and the reserve set up. When actual cost of old equipment is charged to the equipment account it is difficult to know what rate of depreciation should be used. The equipment purchased new and charged into the account at cost new should carry a normal rate while the old equipment purchased at less cost should carry a remaining life rate. As the second-hand equipment is retired the proportion of remaining life rate should be decreased.

Labor is an important item in the cost of beekeeping equipment. The individual who is doing all the work on his own equipment does not need to take his own labor into account unless he wants to get at comparative costs for different operations or methods. The profit he makes is the payment for the use of the capital in the business, his labor and his ability as an operator and manager. If he charges the bee business for his labor his books will reflect less total profit by the amount of labor cost capitalized less the depreciation on that amount. He will, however, get more accurate costs for his equipment and can make cost comparisons more easily. The man who is running a large operation and hiring labor to assemble equipment should keep his time sheet so that labor cost can be distributed properly between the operating expenses and equipment accounts.

Is interest an expense, a capital expenditure, or a measure of profit? It is sometimes one and sometimes another and it is one item about which there is a great deal of very loose thinking. Interest received from the loan of capital is income. Interest paid for the use of capital is an expenditure which is usually an expense of financing but may sometimes be a capital expenditure. If it is interest on money borrowed to build a honey house and buy equipment before operations begin it may very correctly be capitalized and thus added to the cost of the honey house and equipment. If money is borrowed for general operating capital the interest is an expense of operating.

Interest computed on the cost of buildings or equipment when the capital was not borrowed but was put in as needed by the operator, is neither cost nor a capital expenditure. It is not an expenditure of any kind. It is simply a computation to determine whether or not the profits are sufficient to cover a reasonable return on the capital invested, a reasonable labor wage to the operator and something more to compensate the operator for his management ability and the risk involved. Often computations of this character are made as if interest so computed, often called constructive interest, were cost. The results are often confusing even to the operator. Sometimes such computations use a note of interest which is so high that it covers not only the interest which could be obtained from other equally safe investments but also a reasonable allowance for management service and an additional amount to cover risk. If labor for the operator has also been figured into such a computation they should show no profit for the profit is all reflected in the interest rate used. It is evident, therefore, that interest actually paid is usually expense but may be a capital expenditure, and that constructive interest is neither an expense nor a capital expenditure but is simply a means of determining the amount of the profit which should be credited to the capital invested in making an allocation of profit. The profit must cover a normal return on the capital invested, compensation at going labor wages for the actual labor of the

(Please turn to Page 489)

# The Opinions Herein Contained . .

## by Milton Stricker

SOMETIMES a single sentence found in an article of a single issue is worth the year's subscription to a bee journal. Have you found it so? I have and that single sentence is found on page 545 of the November (1948) issue of the American Bee Journal. It isn't a statement that will make you rich, and it isn't something new, but it is something practicable, and best described as "bee sense."

Dig up the Roy Grout article and dwell a minute upon this sentence, page 545: "He also draws a super of foundation on each colony every year." He goes on to state that this is a swarm control measure plus a good way of getting a continuous supply of good combs to replace those that need to be discarded each year. These are prime factors, but more than that, it is also a colony "measuring stick." If just before the honeyflow, your colony isn't strong enough to have this super applied, then the colony isn't ready for the coming honeyflow. Check up immediately. These colonies have something wrong and such things as poor stock, too early swarming, faulty queen, lack of stores, or too small a stock of worker bees can be corrected simply by uniting. Many people do this, uniting two or three of these colonies to make one colony strong enough for the honeyflow. I find better results by waiting until the honeyflow begins. Bees then get the "honey gathering fever" and forget about the "swarming fever." It is then that I add these weak colonies to normal colonies, placing the bodies containing the brood and queen over the bodies containing brood and queen of the weaker sister, but using the "stand" or position of the stronger.

During honeyflows these colonies unite with a minimum of bickering and the inferior queen is sure to disappear leaving the colony at extra bumper strength to insure a bumper crop of honey. The old bees flying home and finding their colony (the weaker one) removed enter other hives and are accepted readily since they come "bearing gifts" (honey and pollen). They continue working from their new homes.

Three-frame nucs moved away from honeyflow area and set out in new location.

Double-story colonies enjoying the mild winters of southern Jersey's "pine area."

Though it took some will power to break from the old-fashioned method of uniting two weaks to make a strong, I made some accidental tests some years ago that led me to believe that a colony cannot be too strong for a honeyflow if it has ample super room and a decent honeyflow lasting at least two weeks.

One time I was offered a more than fair price for two queens that a gentleman admired in a honey producing yard. I sold him the queens each with two frames of brood from their own colonies. Having ordered extra queens and been disappointed by the shipper, these colonies were without queens and not liking that situation, I united these colonies each with another populous colony. At the time I suspect I was "cussing" the Dixie producer who promised but didn't deliver, but he is forgiven now, more than forgiven!

At the end of the honeyflow, these two colonies had each gathered **more than** twice the surplus of any other colony in the yard. Thinking it over, I have tried it several times since and it has given the same results, more than twice the per colony yield during the sumac-sweet clover flow. When tried upon the Spanish needle flow, one colony produced two and a half times as much as any other in that yard.

Now it is standard practice to spend the first three days of the honeyflows uniting. The first day is spent uniting the weak sisters with stronger colonies, as previously described. The second and third days are spent thus:

Colonies not manipulated the previous day are inspected with eyes alerted for the queen. When she is found, she is removed with three frames of brood, two sealed and one of eggs. These are placed in an empty hive body. This is placed upon the original location, given a frame of honey and a frame of pollen. The body is then filled up with empty frames, covered and allowed to sit until the yard has been completely inspected.

As soon as this nuc has been completed, the remaining bees and brood are smoked and united with a queen-right colony. One that has been inspected but the queen had eluded the operator is a good colony to use for uniting, thus saving time searching for the queen.

Before three o'clock in the afternoon I make a habit of removing the nucs which by this time have collected some field bees. Those flying field bees left homeless will seek other hives, increasing their field forces since this is the object of these manipulations. The resulting nucs are moved to other parts of the state where they can build up for the fall flow and though they are sometimes able to harvest surplus, they are always sure of building up into colonies that are strong enough to winter. But the beauty of the system is the extra surplus gath-

ered by those doubled colonies with the superabundant field force. Warning: don't forget these skyscrapers should be given extra supers because if the system works in your area as it does here, it will surprise you.

While reading that November issue, I found an interesting item on page 541. There you will find a picture captioned, "One Demonstration Is Worth a Whole Book." With this I especially agree particularly if it happens to be a demonstration of how not to do a thing. That is just the way this demonstration appears. Notice in this picture the operator is uncapping with an upward stroke. Why does the uncapper do this naturally? I don't know, but without instruction, ninety-nine out of a hundred seize the knife and pull upward, holding their thumb on the end bar where it invites a cut or burn, or "gooed-up" digit.

But that is not the prime rant, it is so much easier to uncap with a downward stroke since the weight of your arm does the work much more efficiently than the upward pull of your muscles. After learning this method, and it takes will power to break from the old you'll do a faster, easier, less messy job and your arm won't be too tired to hold your knife and fork at dinnertime that night.

So many times we learn the wrong way to do a thing. We then proceed to do it so much that the habit becomes a religion with us. It is then that it takes hard-headed and heavy-handed will power to break up the old and don the newer, better methods. I wonder if most of us, myself included, don't get the cart before the horse, practicing age-old movements and manipulations that we inherited or acquired from the old bee masters. How true this seems when getting bees ready for winter using the antiquated "Robbing Peter to Pay Paul" system. When we come to a colony that has more than the sixty pounds required for sustenance during winter and early spring, we divert this surplus to other colonies who do not have that much honey. What a system! Even though these same colonies we help have everything that the others have, i. e., ample force of young bees, young vigorous queen, we feed them, and encourage the perpetuation of a stock that are not efficient foragers.

Introspection shows this is a monstrous system and I must plead guilty. My guilt is especially evident when I think back over the work recently done in a fall flow area. The honey was proportioned out so that each colony got a fair share for wintering and some surplus was left for me. But if I had practiced the reverse of this system, I would have had more honey and more important, my yard would have only excellent foragers left for the coming year's production.

Now what is the reverse of this procedure? Briefly, it is leaving the surplus honey on the best producers, and taking the honey away from those who haven't gathered sufficient for winter. Sounds barbarous? Perhaps, but it is common sense. Those colonies that have filled the third and fourth supers with honey should be allowed to winter this way. Those who didn't fill the second or third or who would need pampering to successfully be brought through the winter, should be killed and the honey extracted from these. Those combs that are filled with pollen or small patches of honey not worth extracting should be stored in a cool, damp place, preferably a comb cellar, to use for next year's increase.

Most of us are prejudiced against wintering our colonies in more than two stories exclaiming that they build up before the honeyflow, reaching swarming strength before the honeyflow begins. Here I have no dispute but early in the spring, at least as early as drones are flying, these three and four story colonies may be split and both sections of the split can be allowed to build up, for the summer flow, or if there is only a fall flow to be reckoned with, a more drastic cut could be made, making other increase at that time or later.

Since the very basis of this unorthodox beekeeping is the propagation of better stock, the new queens must be raised from these very colonies we are splitting. Nine days before the divisions are made, queen cells may be raised from those colonies that you think are truly exceptional. Cells can be given to the queenless section of your nuc which I would prefer to leave upon the old stand to collect the field bees, while the queenright half could be moved more than ten feet away as practiced in artifical swarming. Having an egg-laying queen, this colony can better stand the loss of its field bees than the other that must raise a queen and catch up with its queenright competitor.

## Our Tale of Woe

Ed Wolfe, Director of Publicity for the Federation, tells about Frank Tietge's remarks in the South Dakota news letter. He says: "I have listened to many beekeepers' tale of woe. The farmers cut alfalfa or clover in bloom; roadsides are mowed or sprayed; price support is too low; inspectors are too early or too late. Have these beekeepers made an honest effort to contact farmers about spraying or harvesting? Are their bees and equipment clean? Do they avail themselves of the inspector's experience? Have they made an effort to produce clean honey under sanitary conditions? Have they taken an active part in trying to get cooperation among beekeepers?

"If the answer is yes, to all of these questions, I am sure the criticisms are well founded. If they are guilty of neglecting their job as beekeepers, then the criticisms must be accepted cautiously. Many of our troubles could be eliminated by organizing enough strength to warrant recognition. Beekeepers who have been organized have done some good things for the industry; but the efforts of a limited number of men are never appreciated as much as the efforts of a well-meaning organization."

Think that over. It is amazing how slow we all are; it is amazing how much change is made by the small efforts of the few who are doing the most. What would our industry be like if all of us would rise to Tietge's demand and help pull the chariot?

# The Germinating Ability of Quick-Frozen, Bee-Collected Apple Pollen Stored in a Dry Ice Container

by W. H. Griggs,[1] George H. Vansell, and J. F. Reinhardt[2]

BEE-COLLECTED pollen can be readily obtained in almost unlimited quantities by the use of pollen traps. By careful selection of the time and place of trapping (Griggs and Vansell, 1949), it is possible to get nearly pure samples of any one fruit species. Previous studies have indicated that the viable storage life of this pollen is very short at room temperatures or in cold storage, ranging from a few hours (Singh and Boynton, 1949), to a maximum of two or three weeks (Kremer, 1949 and Griggs and Vansell, 1949). This rapid loss of viability has heretofore been considered one of the main handicaps in the use of bee-collected fruit pollen in artificial pollination.

In recent experiments at the University of California at Davis, quick-frozen samples of bee-collected apple pollen have given as high as 96 per cent germinability after seven months in a dry ice container. This increase in stability should assure future progress in the use of bee-collected pollen in artificial pollination. The idea of using dry ice for storing bee-collected pollen was suggested by the work of Bredemann et al. (1947), who preserved the viability of various hand-collected pollens for an unlimited time with liquid air refrigeration.

A beehive equipped with a pollen trap was placed in a blossoming apple orchard in the Sierra foothills, April 26, 1949. The weather and blossom conditions were ideal for bee activity. The pollen pellets were removed from the trap at thirty minute intervals and put into 20 cc specimen vials which were immediately placed in a dry ice container. The lids of part of the vials were tightened in an attempt to exclude carbon dioxide; others were perforated to allow free entrance of the carbon dioxide. Each sample consisted of approximately 5 to 8 cc of pellets. At the end of the day the container with the samples was brought back to the laboratory where it was stored in a 4.2 cubic foot deep freezer. The freezer was adjusted to maintain a temperature of approximately -13 degrees C without the addition of dry ice. The pellet container was kept packed with dry ice, and enough dry ice was packed around it in the deep freezer to maintain a temperature of about -51 degrees C in the container. Approximately 40 pounds of dry ice were required weekly to maintain this temperature.

The germinability of the pellet pollen was tested at monthly intervals. Two pellets from each vial were dispersed in 3 cc of freshly prepared 20 per cent cane sugar sirup. A smear was then made of the pollen-sirup mixture on an agar medium consisting of either 15 or 20 per cent cane sugar and 2 per cent agar. Experience has shown that much higher percentages of germination are obtained when fresh agar media are prepared for each testing. The following table shows the results of germination tests made on November 25, 1949, seven months after collection of the samples. The pollen was alive at the end of the year. Some samples showed a germination percentage of 84.7 per cent, while the average germination percentage for 53 samples was 50. 4 per cent.

The viability of the pollen was to be further checked by using it to pollinate apple blossoms during the spring of 1950.

**Table I**
**Germination of Bee-Collected Pollen After Seven Months in Dry Ice Storage**

| Medium | No. Samples Tested | Total No. Pollen Grains Counted | Mean Germination (Per Cent) and Standard Error |
|---|---|---|---|
| | Vials Sealed | | |
| 15% Cane Sugar, 2% Agar | 14 | 1,947 | 82.7 + 6.22 |
| 20% Cane Sugar, 2% Agar | 14 | 2,219 | 72.2 + 5.77 |
| | Vials Not Sealed | | |
| 15% Cane Sugar, 2% Agar | 10 | 1,533 | 77.6 + 5.08 |
| 20% Cane Sugar, 2% Agar | 10 | 1,888 | 66.5 + 5.61 |

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# Ash in Honey

## by Bernard Feinberg, Chemist

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IT is one of the functions of the Sixth Army Area Medical Laboratory, Oakland Army Base, to analyze a large variety of food items to determine their compliance with Federal and Military Specifications. One of the items frequently analyzed is honey. Honey is procured by the Quartermaster Corps Department of the Army under Federal Specification CH 571 which calls for honey to "contain not more than .25 per cent ash, not more than 8 per cent sucrose, and shall weigh not less than 11 pounds, 12 ounces to the gallon." This same specification, with minor changes, is contained in the Agricultural Code of California. (2) The values for ash and sucrose in both cases were adopted from the Federal Standards definition. (1) The problem of ash in honey became of interest to this laboratory when it was found that three of nine samples submitted by various contractors in a one-year period exceeded the maximum ash tolerance. Investigation of the literature as the following table indicates showed that high ash in honey was not uncommon.

| Analyst | Percentage of Samples with Ash Exceeding .25% | No. of Samples |
|---|---|---|
| Browne (3) | 35.0 | 92 |
| Eckert and Allinger (4) | 22.6 | 106 |
| Lothrop (5) | 38.7 | -- |

It is true that many of those plants with a high ash content are not important sources of nectar. However, in California cotton and manzanita are two important nectar producers. Eckert and Allinger found manzanita to average .26 per cent ash. This laboratory has analyzed ten (10) samples from different parts of the state of Acala 442 cotton, the only variety of cotton grown commercially in California the past three years. These averaged .36 per cent ash. This honey is of good quality in flavor, aroma, and color.

It would thus appear that a large quantity of good quality honey now being offered by the trade cannot meet the limit of .25 percentage ash. Since the ash content represents the mineral portion of the honey it is nutritionally one of the most valuable constituents. This ash contains nutritionally significant quantities of calcium, copper, iron, and phosphorus. The presence of a high ash does not show adulteration. Indeed the principal adulterants of honey, i.e., sucrose, invert sugar, and dextrose syrups are very low in ash. These adulterants are detected far more accurately by polarimetric methods and specific chemical tests. There may be a tenuous case made for the ash specification as a means of detecting adulteration with honeydew of insect origin. However, honeydew honey differs considerably from floral honey in many characteristics. It is dextrorotatory, high in dextrins, low in invert sugar, extremely viscous, dark in color, and undesirable in flavor. These criteria would appear to be more accurate, more specific, and more fair in distinguishing honeydew honey rather than a high ash content.

The California State Beekeepers Association voted at a session in Fresno to ask the Pure Food and Drug Administration and the California State Department of Agriculture to change the tolerance of ash in honey to that which honeys actually contain. Revision or even total elimination of the ash requirement would make available for possible purchase a large quantity of good quality honey now excluded by Federal Specification CH 571.

Honey exceeding .25 per cent ash content cannot comply with Federal Specifications. A high ash content does not indicate adulteration but rather increases the nutritional value of honey. It would appear that further investigational work is indicated and possible revision of the ash limit might be considered.

We wish to express our appreciation to Dr. J. Eckert at the University of California and Mr. Boyden Hansen of the Boyden Hansen Honey Company for their assistance.

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## Know Your Cover Crops

A recent bulletin of the American Seed Trade Association urged the seed trade to know cover crops and why they are needed. Beekeepers can well heed this same advice. Legumes are the most desirable green-manure cover crops. In the northern area such legumes as hairy vetch, alfalfa, red clover, alsike and sweet clover, may be used. In the South, winter peas, vetches, crimson clover, lupines and burr clover are recommended.

W. A. Wheeler defines a cover crop as "one sown or planted especially for the purpose of checking soil erosion, adding organic matter to the soil, and improving soil fertilization." Unprotected soil over winter may lose one or more inches of precious topsoil in a single deluge of rain.

What are the advantages obtained from their use? They promote soil aggregation, raise the moisture-holding capacity at which tillage practices are most effective, increase depth of root penetration, increase the volume of soil water, make soil resist erosion, are a source of nutrients for plants, food for microorganisms, and when turned under, form organic acids which aid in the liberation of mineral plant foods, which become available to the rootlets of the crop that follows.

Beekeepers can contribute to their bee pasture problem by spreading the good gospel concerning the use of cover crops.

# Honey Helps the Singing and Speaking Voice

## by D. C. Jarvis, M.D.

THERE are a number of foods that increase the amount of mucus present in the throat. These are milk as a beverage, chocolate, oranges, orange juice, and white sugar often in the form of candy. When mucus increases more than is needed to keep the surface of the throat moist it is necessary to remove this excess of mucus from the vocal cords by clearing the throat. If one sings or speaks in public this frequent removal of mucus from the vocal cords is most annoying. The presence of this extra mucus in the throat makes the singing or speaking voice unstable.

It is desirable for a singer or public speaker to add two teaspoonfuls of honey and two teaspoonfuls of apple cider vinegar to a glass of water which may be taken at each mealtime or at any other time between meals. The muscles of the body work on sugar. The muscles that control the vocal cords also work on sugar. Honey is far superior to white sugar for this purpose. It will prevent and help to relieve vocal fatigue should it appear. White sugar increases the amount of mucus in the nose and throat while honey lessens it if more than the normal amount is present. Honey also makes the muscles that control the vocal cords more efficient. The high notes come easier and vocal fatigue is lessened. The apple cider vinegar lessens body fatigue and improves body muscle action. This also aids in a better singing and public speaking voice.

There is another kind of food you should know about that affects the breathing tract. This is protein food represented by nuts, peas, beans, eggs, milk, cheese, poultry, fish, seafood, and meat such as beef, lamb, pork and ham. Protein food is necessary to repair the daily wear and tear upon body tissues which results from the activity of the body. There is no provision for the storage of protein food in the body such as there is for sugar and fat. If more protein food is taken in each day than is needed to repair body tissue the excess must be eliminated from the body. It is eliminated by the breathing tract. When it is eliminated by the breathing tract the secretion in the nose, throat and bronchial tubes increases in amount and becomes thicker. We refer to the presence of this increased thickened mucus as catarrh. This catarrhal discharge may be most noticeable in the nose, the sinuses, the throat or bronchial tubes. Treatment helps very little until one reduces the daily intake of protein food. Often the kind of protein food eaten makes a difference. Some individuals can eat nuts, peas and baked beans, fish, seafood and poultry with no increase in the amount of mucus in the breathing tract or a thickening of this mucus but if they eat muscle meats such as beef, lamb, pork or ham more than once a week a difference in the amount and character of the mucus in the breathing tract becomes noticeable. With others poultry such as chicken and other fowl is a source of trouble. Occasionally fish and seafood or possibly baked beans may be responsible for the increased and thickened mucus in the breathing tract. Study your daily protein intake and the behavior of the mucus in your breathing tract until you learn the kind of protein you can eat without increasing the mucus secretion.

If you find you are developing vocal fatigue take two teaspoonfuls of honey at each meal. More may be taken if you wish. You can use this honey to sweeten food at the meal or take it direct from the spoon. Honey taken at each meal will furnish the muscles which control the movement of the vocal cords the sugar they need in order to do their work well.

On the day of a concert drink a glass of water to which two teaspoonfuls of honey and two teaspoonfuls of apple cider vinegar have been added. Drink this if possible about two to three hours before the time set for the concert to begin. This combination of honey and apple cider vinegar represents the old hayfield drink used for many years here in Vermont. It will make the high notes easier to sing and will increase vocal endurance. If you sing or speak in public try to remember that honey is a sedative to the body. It aids greatly in keeping the nervous system under control and lessens the mental and physical fatigue that may follow appearing in public.

## What About That Split Support Price?

As we see it, so far, the net result of the present support price for honey at two levels has been to depress the market. When the 60-per-cent-of-parity support price was 9 cents, all honey had that value. The result was that table-grade honeys could only be bought for more, and sales were made from 10 to 12 cents for all but the undesirable types. Also, the buyer bought at the honey house. Now, with two support levels—10.1 cents for "table grade" and 9 cents for honeys "of limited national acceptability"—we have a vastly different situation. The buyer is free to call any but the finest honeys "undesirable," so he buys all he can get at 9 cents; and he can get all he wants at 10 cents delivered to his plant. The net result is that we have a lower market at the present time than we did under the 1950 program with a 9-cent support level.

Who was the person of wisdom that decided there should be two price levels? Who introduced this wedge in buying? Certainly, it was not the industry.

When it comes to the point where administrative personnel decide what is best for the industry, instead of following the best thinking of the industry they serve, we are many steps nearer the place where our government by representation becomes one of autocratic authority. And we then are losing those very freedoms at home for which we now are fighting overseas.

# Breeding Improved Honey Bees

## V. Production of Hybrid Queens

by William C. Roberts and Otto Mackensen

U.S.D.A., Agr. Res. Adm., Bureau of Entomology and Plant Quarantine

EVERY commercial queen producer has his own system of management. Just what system will produce the best quality queens at the most economical cost is not definitely known. Having been engaged in the breeding and testing of bees for a number of years, we have naturally tried many methods. Herewith we will describe the method that we use for producing large numbers of hybrid test queens at the Kelley Island, Ohio, mating station. We use this method because we have found that it produces the largest proportion of good queens at the most economical cost of any method that we have used.

In testing stocks we, of course, must have environmental factors of queen rearing as nearly constant as possible and must also attempt to produce queens of the highest quality. In order to measure genetic differences we must create an environment that will permit the genetic potentialities to be expressed to their fullest extent.

We begin to prepare for queen rearing in the fall. Six months before we intend to make the first graft of queen cells we requeen every colony on the island with queens from which we desire drones the following year. Let us call these queens hybrids (1 x 2), produced by crossing inbred lines 1 and 2. Into every colony we introduce a (1 x 2) hybrid queen. Since the island is isolated and every colony has a (1 x 2) hybrid queen, we will have control of the drone population the following year. We clip all queens and mark them so that they can be identified and found easily.

All colonies must have ample populations of worker bees to winter properly and build up rapidly in the spring. They must also have enough honey properly organized for wintering plus plenty of reserve for build-up in the spring.

Our colonies are in square hive bodies. Each hive body holds 12 frames of the Dadant shallow size. We winter each colony in four hive bodies. When ready for winter, the colony has a (1 x 2) hybrid queen, a good population of young bees, 70 to 80 pounds of honey, and several frames of pollen. The bottom entrance block is placed in the entrance with a ¾-inch opening for a lower entrance. A 1-inch auger hole in the second hive body from the top gives an upper entrance near the location of the winter cluster of bees. Colonies prepared in this manner in the fall need little, if any, attention during the winter.

About March 15 we check the colonies for queens, brood, honey, and pollen. At that time most of the cluster of bees and the brood nest should be in the top hive body. If not, we organize it so that supplemental feeding of pollen cakes can proceed in an orderly fashion. We give the colonies 1- to 1½-pound pollen cakes by placing them on the top bars between the frames and the reversed inner cover. We give additional pollen cakes as needed—one every week or 10 days—until the supply of natural pollen is adequate. We usually have to feed pollen cakes until about May 10, or at the beginning of apple blossoming.

When we give the third pollen cakes to the colonies, we add a drone comb to the brood nest. The colonies get an additional drone comb with the next pollen cakes. All swarm-box and finishing colonies get two to four good drone combs, and they remain part of the brood nest throughout the season.

From the 4 to 6 frames with brood on March 15 the colonies should expand their brood nests to about 20 frames with brood on May 10. As soon as the colonies have brood in two hive bodies, we interchange the upper two bodies so that the brood nest can expand rapidly. When the brood nest expands to the three hive bodies, we interchange the top and bottom bodies around the middle hive body with brood. At about that time we are ready to begin queen rearing.

In our operations we plan to make our first graft of queen cells about May 10. To insure prompt matings it is necessary to have adult drones in the hives when the first graft of queen cells is made. To have adult drones on May 10 we must have drone eggs on April 15. Thus we give our colonies drone combs about April 10 with the third round of pollen cakes.

Drone combs are very important in our operations. We inspect them every time we work the colonies. We never allow them to be shoved outside the brood nest or to be filled with honey. We have a standing rule that when we cannot find plenty of drone eggs, larvae, pupae, and adults, we stop all work and put these good dark drone combs in the middle of the brood nests so that the queens will fill them with drone eggs. One has to run low on drones only once to find out how valuable they are in queen production.

For starting queen cells we use a modification of the swarm box. To prepare a swarm box we find the queen in the colony and set the frame she is on aside. We set the top hive body on a screen division board on top of the reversed hive cover on the ground. In this hive body we have 10 frames. At least three of the frames in the center must be one-half to two-thirds filled with open honey and pollen. The other six frames should have a little honey but should not be heavy with sealed honey. We shake the bees from 8 to 10 frames of brood into this hive body to get about four pounds of bees into this body. We place the inner cover immediately on this hive body to prevent too many of the bees from flying off or crawling over the sides of the hive body. The rest of the colony with the queen we put together and place this modified swarm box on top of the hive, followed by the outer cover. We thus have a swarm box made up on top of a colony with the bees and equipment from that colony.

The bees confined in the swarm box are the nurse bees from the brood nest. They have no brood until

they receive grafted queen cells. They are supplied with frames containing honey and pollen and are separated from the hive by a screen division board. The temperature of the bees in the swarm box is partly controlled by the colony below through the screen division board. Unless the colony is in the sun during excessive hot weather, we do not fear overheating the bees in the swarm box. However, these swarm boxes, as well as the other colonies used in queen rearing, should be in the shade.

In our operations we make up swarm boxes on four colonies just before noon. Immediately after lunch we give each swarm box four bars of grafted cells. For the first graft we use large larvae (about 36 to 48 hours old) and graft into dry cells. Any colony, usually a swarm-box colony, is the source of the larvae for this first graft. Each bar of cells has 20 to 23 cells. Two bars of cells to a frame and two frames of grafted cells to each swarm box give approximately 80 to 90 grafted cells to each swarm box.

We place the two frames of grafted cells in the swarm box with one frame containing honey and pollen between the frames of queen cells and the other frames of honey and pollen next to the frames of queen cells. When removing the outer cover and the inner cover to insert the frames of queen cells into the swarm box, we use very little smoke and do not worry about the few bees that fly out. These are field bees anyway and are of little value in the swarm box.

Twenty-four hours later (the next afternoon) we remove the cover from the swarm-box colony, lift the swarm box off, remove the screen division board, replace the swarm box on the top of the colony (now united by the removal of the screen), remove the two frames of queen cells, push the remaining frames together, add two empty combs to fill up the space, put the inner cover on the hive, place the screen division board on it, and finally put the outer cover over all. When the colony is closed, all we have left on the outside are two frames of queen cells that are well supplied with royal jelly and covered with bees.

After we have emptied all four swarm boxes, we shake the bees off the started queen cells and take them to the grafting house. Here we consolidate the accepted cells of the 16 bars of cells into 12 bars. Each bar has 20 to 23 queen cells. We now remove the queen larvae from these queen cells and are ready to regraft into queen cells that are well supplied with royal jelly.

We regraft with 24-hour larvae from our breeder queens and give one bar of regrafted queen cells to each finishing colony.

The finishing colony is most important in the rearing of good queens. It is a very populous, queen-right colony in which brood rearing is never restricted. To provide ample space for such a colony, at least four shallow hive bodies are necessary. We use the upper hive body for finishing queen cells and confine the queen to the lower three hive bodies by an excluder. We place the frame for queen cells in the middle of the upper hive body between frames of unsealed brood.

On the day before giving a finishing colony a bar of queen cells, we raise three to six frames of unsealed brood and move the older sealed brood to the brood nest below the excluder. The main brood nest of the queen in the finishing colony is in the hive body just below the excluder. She can expand into the lower hive bodies.

When working a finishing colony to raise young brood, we put the heavy combs of honey to the outside in the lower hive body and move up partly filled combs to the upper hive body so that the brood nest does not become crowded. The bees will keep moving the honey up if it is not sealed. It is not necessary to feed a good colony of bees to stimulate or keep brood rearing or queen rearing progressing at a high rate, provided the colony has ample food.

When a heavy honeyflow is on, we add a fifth shallow hive body, placing it on top. This helps to keep the brood nest open by giving more space outside the brood nest for nectar storage. However, it is not advisable to have frames of empty combs just above the queen cells. They should be near the outside of the super.

Seven days later we give another bar of cells to the finishing colony after young brood has been raised above the excluder.

Ten days after the queen cells are regrafted we put the cells into the nuclei at the mating yard. Our nuclei hold four shallow frames. We use a triple "nuc" box formed by dividing a super into three compartments. Each "nuc" has two auger holes one below the other, and the three nuclei in each box have similar holes on different sides of the hives.

No colonies are placed in the mating yard. Strong colonies may incite robbing with the result that nuclei may be robbed out. Our drone-producing colonies are our cell-finishing, swarm-box and reserve colonies located no closer than 250 yards from the "nuc" yard.

The breeder queens used on the island are of one inbred line artificially mated to drones of another. They are not so vigorous or such good layers as noninbred or hybrid queens, and therefore require different care than the commercial queen producer is accustomed to providing.

These breeder colonies must get help from other colonies to insure adequate numbers of young bees to keep them populous. If a breeder colony is allowed to become weak, the egg production of the queen will decline and the larvae used in grafting to produce hybrid queens will not be well supplied with royal jelly previous to grafting. Should this happen, both the quality and the quantity of the hybrid queens will be lowered.

To keep an ample population in a breeder colony, we must add young bees at frequent intervals. In our operations at Kelleys Island we use the two-queen colony system. Figure 1 shows how such a colony is made up and organized. It is not difficult to operate, and its use insures a steady addition of young bees to the breeder colony without great danger of losing the breeder queen.

We introduce the breeder queen into a newly made-up colony. When she is well established and laying satisfactorily, this colony becomes the top unit of a two-queen colony. The queen in the lower unit, or booster colony, is a good vigorous hybrid queen and furnishes young bees for strengthening the upper unit.

The procedure for establishing a two-queen colony is as follows: We move a first-class colony to a location convenient to the grafting house. This colony is in a shallow four-story hive with the brood nest in the lower three hive bodies. After the colony becomes established, in two or three days, we consolidate the queen and all her brood in the lower three hive bodies, place an excluder above and below the fourth hive body, and the two-story breeder colony on top of this booster colony. All hive bodies with brood have 1-inch auger-hole openings at the front of the hive. The entrances to the

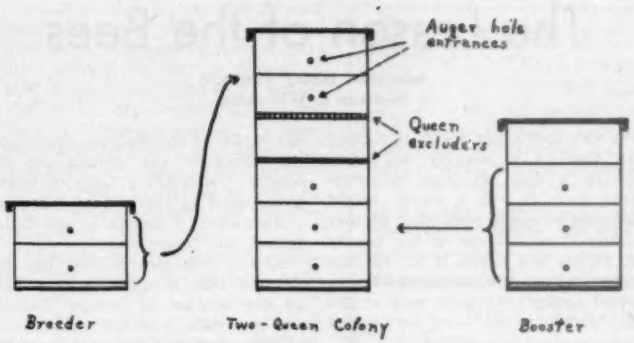


**Figure 1. Diagram showing establishment of a breeder colony above a booster colony.**

two units of this now two-queen colony are on the same side of the hive. The bees of both units mingle, but the two brood nests are separated by two queen excluders and a super for storage between the excluders. Bees from the lower brood nest go to the upper brood nest through the excluders and help keep this upper unit populous. Returning field bees, using the auger-hole entrances, tend to drift to the upper breeder unit, keeping the population ample in this unit.

During a honeyflow the bees tend to crowd honey into the brood nest of the breeder unit. Since the queen producer is grafting from this colony every few days, he can easily keep an open brood nest in the breeder nest by moving frames of honey to the lower unit as space for brood rearing or honey storage is needed. It is advisable to check the lower unit of this colony once a week to prevent overcrowding or swarming.

Since the two brood nests are separated by two excluders and the intervening super, there is no danger of the two queens coming in contact with each other. Because there is always danger of a virgin queen entering the breeder colony and killing a valuable queen, a small square of zinc excluder is placed over the auger-hole entrances of the breeder unit. Bees passing through zinc excluders lose part of their pollen loads. Thus it is advisable to watch the supply of pollen in the breeder unit and add a frame of pollen when necessary to insure proper feeding of the larvae.

The queens produced at Kelleys Island are two-way hybrids. An inbred queen of line 3 artifically mated to drones from inbred line 4 is the source of the hybrid queens (3 x 4). The beekeeper who purchases these queens has hybrid queens (3 x 4) heading his colonies. Since all drones on the island are sons of (1 x 2) hybrid queens, the worker daughters of these hybrids queens will be (1 x 2) x (3 x 4) double hybrid workers in a colony headed by a single hybrid queen. If, in addition, the opposing sex alleles in the final cross are different, the hatchability will approach 100 per cent and the brood quality will be excellent.

To provide the bee industry with the foundation stock for the production of such scientifically compounded hybrids, adapted to various purposes and various localities, is the objective of the Kelleys Island breeding project that is being conducted in cooperation with the Honey Bee Improvement Cooperative Association.

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## Legume Seed Production . . .

Two mimeographed publications recently have come to our attention which are excellent additions to information available on legume seed production and pollination. One is entitled "Growing and Harvesting Grass and Legume Seed," a 14-page publication, An-122, issued May, 1951, by the Agricultural Extension Service of Iowa State College, Ames, Iowa. The other is entitled "Insect Control and Pollination Recommendations for Alfalfa and Clover Seed," an 8-page Ext. Mimeo, 581, revised April 1, 1951, and issued by the Extension Service, State College of Washington, Pullman, Washington.

Both publications thoroughly discuss control of harmful insects and make recommendations concerning the proper use of honey-bee colonies for increasing seed yields. The Iowa publication also discusses fertilizers, seed treatment, plant diseases, weed control and harvesting. We presume that these publications are available only in limited quantity intended for extension work within each state, but those interested likely may obtain copies by writing to the publication sources.

## New Utah Folder on Alfalfa Pollination . . .

"Honey Bees for Higher Yields of Alfalfa Seed in Utah" is the title of an attractive 4 by 9 inch folder designated as Extension Service Bulletin 238, Utah State Agricultural College, written by George E. Bohart, Agricultural Research Administration Bureau of Entomology and Plant Quarantine, and George F. Knowlton, extension entomologist, Utah State Agricultural College. The bulletin briefly but adequately tells the story of the part honey bees play, through pollination, in seed production, and the control of harmful insects. We quote the following interesting chapter from the bulletin.

"Neither the seed grower nor the beekeeper should expect pollination to be the complete answer to high seed yields. Pollination can be regarded as an essential link in a chain of factors affecting the yields. Without pollination by bees satisfactory yields are impossible, but even with the best of pollination, other factors such as adverse weather, insect damage, and poor harvesting can break the chain and keep the seed from reaching the bag."

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# The Lesson of the Bees

American Honey Institute
Madison 3, Wisconsin

It was fall. I sat beside a sapling oak tree on a country hill overlooking a wide expanse of fertile farm land. It was a warm, bright day, one of those gems that Mother Nature often lets out of her beauty kit before she closes it up for the winter. A streak of autumn sun lodged against the dark bark of the oak, and bounced back across the grass where I was sitting.

As I reveled in the coziness of the blanket of sun around me, a burnished red oak leaf fell to the ground in one last burst of glory. It settled across my foot. As I leaned down to pick it up, my eye caught a glimpse of a small golden form tucked in between two blades of grass.

I recognized it instantly as an old friend of mine. For a honey bee, spent with the hard labors of her short lifetime, lay prone at my feet. Her yellow body was unnaturally still, her wings no longer vibrated. Her home, a brightly painted white hive, was just a few yards away. But it had been a few yards too many. This honey bee would no longer return.

At first I felt sorry. I had come to learn the life and habits of the honey bees as I watched them flit from one bloom to the next in wild excitement, as if each succeeding flower would hold a pollen even more succulent than the last. I had watched eagerly as they poised on a clover head, fearing they would fall off, knowing they would not. And I had seen them congregate around their little white house with the same air of community spirit as you'd find in front of a country church on Sunday morning. I felt a common interest with them.

But as I gazed on the little worker bee my sorrow vanished. She had lived a good life, a full one. Her short life span was a normal one for a honey bee, and she had performed admirably during it. I could not mourn for her.

Rather, I could learn from her.

I watched a tiny ant tugging and pulling at another of its kind who had fallen by the wayside. I watched a green slippery-looking caterpillar weave her cocoon tightly around her for the winter. I watched a fly light on the grass beside me and snap up a tiny white worm for his supper. I watched the oak shake its leaves to the ground for the winter. I watched a blade of brome grass bend to the will of the wind.

And again I looked at my fallen friend, the honey bee.

And I saw clearly how her life fit into that precious pattern called the balance of nature. And so did the ant's, and the caterpillar's, and the fly's, and the oak's, and the grass'. And so does man's.

It was as if a gigantic jigsaw puzzle finally had been put together, with every piece in its rightful place, making a completed whole. One missing part would have upset the whole picture. Each part was of equal importance, for without any piece, no matter how small, the total picture would be destroyed.

My little worker bee who lay prone at my feet had added her little bit to the picture. Her tireless efforts of carrying a cargo of pollen had cost her her life, but not before she had made that life a useful one. She had done her part and done it well, and there would be others to carry on the task. There was no need to feel sorry for her, only to be thankful because of her.

I couldn't help but carry the thought to its logical end. Man, too, must have a designated spot in the pattern. For all his wits and intellect, man must follow a role that has been set aside for him.

It was how well he performed in this role that mattered. The honey bee had done her job honorably. Man with the added advantage of a mind, must at least follow suit.

As I ran my fingers through the grass my glance rested on the small colony of bees not too far distant. Therein lived a blue-ribbon example for mankind. I marveled at the community spirit, the lack of selfishness, the devotion to duty of every citizen of the hive. Each honey bee worked for the common good, so that she herself might live prosperously.

How well man might benefit from such a standard! Man's place in the universe, and in his own world community would be just as secure as the honey bee's if he practiced such high ethics in community living. Atomic bombs, world wars, germ warfare would be obsolete terms. Life would be more serene, certain.

But man must go one step farther than the honey bee. For he lives also within his own "common-interest" community. Man is unique in that he has the chance to choose the job he will do during his lifetime; it is not automatically assigned to him as it is to the honey bee. And because of this choice, all men do not work at the same job. Instead, each does what he is interested in.

Thus he quickly associates himself with others who have the same interests.

Beekeepers for instance are not drawn to bricklayers or welders, but they are to other beekeepers. A common interest binds them into their own community. It is in this special community that mankind must apply the lesson of the honey bee, the lessons of industry and cooperation.

Although I was far from big city life, I felt the interweaving of the city and the country now. For it was to the big cities that beekeepers came to take part in their special community of honey affairs. To conventions, state and national, to bee supply houses, to big markets, to the offices of their state associations and of the American Honey Institute the beekeepers came, searching for a way to better their common community.

It is certain that they found what they were looking for at the American Honey Institute. I could not help but think that the Institute was founded with the right motive, with the right idea. To have a formal, official way of expressing good will among all beekeepers, that is why the Institute exists. To have a way of offering common help to all beekeepers, that is the function of the Institute. To consolidate the efforts of all beekeepers to promote their honey, that is the aim of the Institute.

I would not be foolish enough to claim that the Institute has done a 100 per cent job of completing these aims. That would be to claim perfection, and no man in his right senses would make such a claim.

But I knew the Institute had drawn closer to its goals than at any time in the past.

I knew that it was right for the Institute to exist as a generator of community spirit among beekeepers. just as right as it was for the ants to work together in their ant hill. Just as right as it was for the honey bee to belong to her hive.


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# You Asked Us - -

**How can you identify pollen and how much should be left on a two-story colony for winter?**

**Mrs. Cornelius Stob, Illinois**

Pollen is a solid substance found in the cells. It varies in color, especially in the spring when pollen is being brought in from many sources. The color also varies according to locality. It will range from mauve and lavender through shades of yellow and orange to green. A prosperous colony will bring in about 75 pounds of pollen during a season.

Surveys of fall pollen reserves and normal colony requirements have been made in the intermountain states, the north central and Pacific coast states and in the South. In all these regions pollen reserves have been found inadequate. In most northern beekeeping areas, colonies should enter the winter period with the equivalent of three to five well-filled pollen combs. A reserve of approximately 500 square inches of cells containing pollen is desirable. Pollen reserves must be located within the cluster if they are to be utilized. A pollen deficiency can be largely overcome by feeding trapped pollen supplemented with expeller-processed soybean flour.

**Does the hedge plant, multiflora rose, yield nectar and pollen? Can as tight and as strong a hedge be grown with privet?**

**E. Fuhlbruegge, New Jersey**

Plants of the rose family (Rosa) generally yield pollen abundantly. They are often valuable for this source in localities where they bloom at a time when pollen is scarce. As a general rule, roses do not yield nectar. Thus multiflora rose can be expected to be a pollen source but unlikely a source of nectar. We have so far not heard of it yielding nectar.

Multiflora rose, properly spaced, grows into a compact, thorny, rather impassable hedge of trailing growth which livestock do not browse and thus makes a living fence to turn most kinds of livestock. Privet, closely spaced, can be expected to grow into a tight, strong hedge but we do not know that it would meet all the requirements of multiflora for a livestock fence. However, for wildlife areas, some nectar producing shrubs like Tatarian honeysuckle and the bush Lespedezas bicolor and cyrtobotra might well be planted in alternate rows with multiflora to serve the dual purpose of furnishing nectar for bees and feed for birds. The shrubby lespedezas mentioned do not mature their seed in the North.

**Does copper ruin honey?**

**Isadore A. Didion, Ohio.**

Only a few tests have been made of the chemical action of honey on metals. These have been primarily concerned with the zinc coating of galvanized sheet metal which is commonly used for honey storage tanks and honey handling equipment, with iron tanks and with aluminum. The acids of the honey do attack the zinc coating of galvanized metal but so far as is known this is not injurious to any extent. Once the iron coat is exposed, however, the acids form tannates which blacken the honey when in the presence of heat over a long period of time. The aluminum is apparently a metal satisfactory for honey handling equipment and no ill effects have been established.

While we have no definite information relative to the chemical action of honey on copper, we do know that it has been used for many years in the industry both in the form of heating elements and in the form of coils through which honey either passes in the presence of heat or coils in honey tanks in which hot water is passed through the coils. So far as we are able to know copper does not ruin honey in any way.

**Would it be advisable to pack my bees for winter with brick piled up around the hives and filled in with straw, then covered with tar paper tied in place with twine?**

**W. A. Kerr, Iowa.**

It probably would not be necessary to use that much packing for winter except in very cold climates. A single thickness of black paper is more commonly used where it doesn't get too cold. Black paper absorbs the heat from the sun and protects the hive from cold winds. With as much packing as you describe it would be hard for the sun's warmth to penetrate the hive, and that is very essential on warm winter days. This warmth causes the bees to move over to new stores and take cleansing flights.

If the bees go into the winter with a good queen, plenty of young bees and good stores of honey they will come out all right in the spring without much heavy packing. Top ventilation is important also.

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**What is the top entrance for bees? Is it practical or better than the bottom entrance?**

**J. W. Hoopes, Florida**

A large number of beekeepers use a top as well as a bottom entrance. Do not close the bottom entrance entirely. In winter, on warm days the bees will take out dead bees through the bottom entrance. If it is closed, the dead bees will pile up on the bottom board.

One type of top entrance is the auger hole bored in the back of the hive, or in the top handhold. This, with the bottom entrance, affords ventilation in the hive and allows moisture to escape in cold weather. The bottom entrance should be reduced in winter. This will prevent mice from getting into the hive and yet allow bees to come out for a cleansing flight. If the bottom entrance becomes clogged with snow or ice, the top entrance permits the bees to come out for flight.

Another type of top entrance may be made by staggering the hive bodies, or pushing the top hive body forward to allow the bees to go in and out through a crack. This may be used in summer but is not practical for winter.

Other methods of top ventilation are used. The idea is to provide the bees with a top entrance if the bottom one is closed for any reason, and to provide better circulation of air in the hive.


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The same system is applicable to the spring honey crop that will be mixed with white honey and also with the remaining supers of buckwheat honey that will be filled up with the fall honey for the region having this crop. This system of grading the honey super by super is a valuable time saver compared to the current system of grading it frame by frame at the uncapping tank. With this method you will obtain more amber honey and less in the darker grades. Also your white honey will not be mixed with inferior honey from spring and fall flows.

Bruno Racine, Canada

## A Neat Way to Winter Bees . . .

Finn's Apiaries, of North Mankato, Minnesota, use this neat way of packing bees for winter. If we understand the procedure, a tar paper wrap is first put around the hive; then an insulating roll is wrapped around except in front, and held tight by the two strips. The top cover of insulation is likely of the same material. Strings tied around complete the pack. There are both top and bottom entrances and two hive bodies and sometimes three are packed together.

## Temporary Control of Robbers

If there is a very necessary examination to make in a colony which requires brood-nest examination at a time when robbing is bad, our boys in the Dadant yards tried a stunt this fall that seemed to help avoid most of the robbing. There were supers on the colony they wanted to look over, so they set the supers on the bottom board and moved the hive into a wooded area to make the examination. The entire job took about a half hour. Then the hive was returned to the spot where it belonged and the supers set back on as they were. This will not work where numbers of colonies are to be examined but for a small job like this it seems to do all right.

## Cheap, Convenient Wintering . . .

The two pictures above illustrate my method of winter packing. First, wrap roofing paper on three sides of the hive leaving the sunny side open. Then I drive sticks into the ground to hold the coarse straw which is stuffed between the sticks and the hive body (see top picture). The snow blankets the top, further insulating against cold and wind. In the spring the packing can be removed quickly and the paper and even the straw saved until the next winter.

The hives are M. D. bodies and the paper is left projecting at the front to act as a windbreak for the entrance. The covers are "I-V" which prevents excessive hive moisture. In very severe weather I plug the top entrance with a thermos cork.

Wm. Maxant, Massachusetts

## Fuel . . .

Pieces of the corrugated boxes in which I receive my Lewis-Dadant supplies, torn to half dollar size, make good kindlers for the smoker. A strip cut 4 inches wide and rolled with a similar layer of rags to the size of the fuel chamber is also handy to use.

## Grafting Tool . . .

A grafting tool can be quickly and easily made from a piece of wire about the size of frame wire and a piece of pencil-size wood. Make a very small loop on one end of the wire and flatten it thin and bend to a right angle. Force the other end into the end of the wooden stick. Put an angle in the shaft of the wire to give a clear view into the cell and the flat loop or half loop can be rotated or pushed under the larvae.

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# This is the Month

## by Frank E. McLaughlin

November. Corn is in the shock. Frost is on the pumpkin vine. Time to take a breathing spell from all the summer's work. Some of you are proud that your bees did so well, others are disappointed in their crop. I'm one of the latter.

My family and I enjoyed a very nice visit with our good friend, G. H. Cale, over the Labor Day weekend. It is always a great pleasure to visit with Mr. Cale and have a good talk on beekeeping.

The fall flow in my locality was slightly better than the early honeyflow. Even though it rained a lot, the bees were able to gather some nectar from the Spanish needle, aster, and heartsease. From what I hear, some beekeepers in Missouri along the river got bumper crops from the fall blossoms. I haven't prepared my bees for winter yet, so don't know if I will have to unite some of them so they can winter or not. The honey situation here in my immediate vicinity was very slim the entire season.

### Preparing for Winter

By this date, everyone knows how many colonies of bees he is going to try to winter. Let's hope everyone has left plenty of stores on each colony to carry them through. It is not the real winter that you have to worry about so much, as far as stores are concerned. But when early spring arrives, the bees start raising brood, and there is no nectar coming in, they really use up the stores. Early spring is the time when so many bees are lost.

Besides leaving plenty of stores, making sure the colony has a good young queen and providing a good windbreak are important. If your colonies of bees are out in the open, they get the full force of cold wind. If you have your bees on the south side of a natural windbreak, such as woods, buildings, or a south hillside, you are fortunate. I prefer to face all my hives to the south. For those who have no natural windbreak, one can be made in the form of a high board fence. Boards in the fence need not be placed together solidly. A small space may be left between them to let a little of the wind through. This lessens the force over the fence. This fence should be on the side from which the greatest force of wind comes; usually the north or west side.

### Culling Combs

While preparing bees for winter, cull out empty, misshapen combs and combs full of drone cells. Good combs can be dropped down into the brood chamber from the super to take the place of any undesirable combs in the brood nest. The crooked combs and drone combs can be cut out and melted up for beeswax, and new foundation placed in the frames for use next season. **But do not put frames of foundation in the hives for winter.**

### Winter Activity

With the winter months at hand and outdoor activity with the bees over for another season, you can plan next year's management of your bees. Winter months are the time when I catch up on reading bee books and magazines that have been laid aside during the busy season. Winter is also the best time to clean, paint, and repair equipment for the spring and summer season with the bees. It is very annoying to want some piece of equipment during the busy season, and find that you forgot to get it ready for use when you had the time.

### Fall Planting

Fall is planting time for trees and shrubs and some seeds. Of course, the time varies according to climate. Here in the Midwest, the best time is from the middle of October through the early part of November, according to nurserymen. There are many types of trees that are nectar and pollen bearing, such as basswood, tulip, pussy willow, locust, Vitex, and many others. Of course, most of these trees will not bloom for several years, but we always need to plan for the future. Many kinds of seed of honey plants which are planted this fall will produce bloom next season. You can write Pellett Gardens, Atlantic, Iowa for pamphlets giving the names and prices of various types of seeds and plants.

### Wax Rendering

A simple way of melting beeswax for those who have small amounts, is to put the cappings and comb in a cloth sack and submerge it in hot water. Keep the water hot and punch the sack with a stick occasionally to keep the comb stirred up. The wax will come to the top of the water, and can be skimmed off. Or the sack can be weighted down, and the water left to cool, after all wax is thought to be melted. The wax will harden when cool and can be lifted out.

Another way is the double boiler method. Put the comb in a bucket and place the bucket in a larger container of hot water. Keep water hot by means of a gas plate or something similar. When wax is melted, strain while hot through screen wire (or cloth if there is a lot of slumgum) into cans. Let stand until wax is hardened.

There is still another way of wax rendering. That is the solar wax system as explained on page 523 of the "Hive and the Honey Bee." With beeswax needed in this country and selling at a good price, no wax should be wasted.

---

I will be glad to answer questions if readers write me in care of American Bee Journal, Hamilton, Illinois.

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# All Around The Bee Yard

## by G. H. Cale

Look at those leaves drop. Feast on the color in the maples and the oaks — for this is fall, a time of sadness and farewell. At least for beekeepers who now put the last touches to their bee yards before the snow makes memory the one warm remaining link to bridge the gap to spring.

That is the way the beeman in winter climes sees it. I often wonder what the seasonal pictures are for those with bees in the South; or in what we call the Deep South; or in hinterlands so far away; where to us winter is summer and summer is winter. We are apt to see problems from our own doorstep and to write about them that way.

---

Been using two old style Dadant hive bodies for many colonies the past few years. Seems like a tremendous amount of comb space, doesn't it? Surprisingly it is the usual thing at the height of the laying season to find brood in both of the two big bodies; more brood than one body could house. The new hybrids lay great scads of brood. I doubt if three ten-framers would be enough. Two big ones are a task to handle, but, thanks be, I use shallow extracting supers and they are easy to handle. Put a two-queen plan in use with these outfits and I don't see how one stack of bees can possibly produce so many workers. In fall they delight the eye; great gobs of bees for winter and stores in abundance.

---

Been trying to produce bulk comb honey with these big colonies in two big hives. Our Wisconsin manager figured how to go about it and he turned out some of the most beautiful bulk supers you would care to see; and a buyer gobbled them up in a hurry. All he wanted to know was if the bulk honey in these deeper shallows would cut right. He cut about eleven pieces, pound jar size, from each comb, with very little waste.

Each super averaged fifty pounds! So that's a darn good job of bulk comb production with a big, big hive outfit. And we had been told it could not be done. We would like now to try for section honey just because we have been told that can't be done either.

---

What average-per-colony crop measures the value of a location? I used to contend that a place that would give an annual turnout of one hundred pounds to the colony was a good place. But — now with ten cent honey one had better keep on paper hanging or school teaching or bee journal editing at this figure to keep from starving. With no more bees than one person can handle in spare time, beekeeping on this basis is okay. But don't get into the employer class, competing with dollar-an-hour wages; don't get too big a gas bill at 25-30 cents per gallon; and keep the truck wear down, as a new one gets way up around $2500. Gosh no, don't do it. Be small and happy!

---

Along this line, a good beeman told me lately that he figured he must get 150 pounds per colony of extracted honey to make a living from bees alone for himself and his wife and one boy. What I want to know is where is that location? He didn't tell me and it's well he didn't because bees are so easy to move.

---

I suppose you boys who pollinate read this with a smile that I can't see, but how is a guy like me, with all his bees in a red clover country going to substitute pollination for honey production? We went into cahoots with an experiment station this year to do some red clover pollinating. Result less than a bushel to the acre. If I lived in vetch country, or irrigated alfalfa, or big Ladino country, or crimson, or white Dutch seed, or big time sweet, bet your boots I'd pollinate and I've just got a notion honey could go hang. But the vast numbers of us have only red clover.

I've just struggled and struggled to save up to pay my dues to the Federation; finally did it, at five cents to the colony. Next year I'm going to set aside three colonies and they will be stenciled "Federation." The crop won't be mine. I may even turn it in to local sales. But that dough belongs to the Federation; not to me. Just like the "Lord's Acre" that the rural church uses. Why not? It's a good stunt and it's painless. And believe me, without a national organization these days we are as nothing and like the sands by the shore, many are the feet that will tread on us.

---

I am still looking out of the window as I write and bemoaning the fact that six months must pass before I can do anything more than gaze at a bee yard. I suppose this winter I will lay grand plans for doing a better job next season. For one thing I know I'll plan to renovate some of my equipment. It is surprising how the nails on many of my hives have worked out of the wood until they now extend from a fourth of an inch to a half inch. Some hives are getting crumbly. I have hives that have been in use seventy-five years and I can still use them if I do some work on them. I know that I am not yet seventy-five years old but these hives were among those that C. P. Dadant put into use in 1878. I bought them when I got my first lot of bees after I came out here thirty-one years ago. Most of the equipment is of a later vintage; some just a few years old. But paint won't hurt any of it and a nice hammer will make a world of difference in most of it. As I say, it's nice to make these plans, but will I carry them out? I doubt it. That is what makes plans so nice, you don't have to do a thing about it.

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# Market News

## by M. G. Dadant

### Total Crop 1951

New England states fared well during 1951, all reporting better than last year and, in Vermont where the 1950 flow was poor, the crop will run nearly four times as large as it did a year ago.

New York sections vary although western New York reports a better total crop than last year. In other sections the flow has been mediocre. New Jersey will have as much honey as last year. In Maryland, the crop has been short but through Pennsylvania, Ohio, and into Indiana the crop will be considerably in excess of 1950. Georgia, Florida and the Carolinas probably have considerably more than last year, particularly Florida, with a generally fair average throughout the southern states except Texas. Here the crop has been an extreme disappointment, probably from 25 to 40 per cent of a year ago, and the fall flow was negligible except as a safety valve for winter stores. Michigan reports about as good as last year and Wisconsin perhaps as good, with a varied crop in Illinois. Some sections here were far better than a year ago and the total undoubtedly will be as good as 1950 although far below expectations. In Iowa, the total crop will be much less than a year ago although some scattered sections had an extremely good flow. The whole Red River Valley is better than in 1950 but parts of Minnesota are not so good, and light crops are reported in Nebraska and Kansas as well as Oklahoma and Missouri, except for a good fall flow in Missouri. Arkansas reports are better than a year ago and Louisiana is about average.

In the intermountain states, Colorado appears to have a much better crop than a year ago, Utah better and Nevada less. Wyoming is probably a little better with Montana being about average although early expectations were for a heavy flow. Idaho reports only moderate crops with Washington and Oregon considerably better. In California reports are varied although southern California undoubtedly has had a light crop except for a better than average orange flow. Central California is about average with northern California perhaps considerably better than in 1950. Arizona reports are about average.

All in all, according to the government preliminary report, the crop appears to be 7 per cent above last year although our opinion would be that it would do well, considering the late fall flow, to reach the high total of 1950. In addition, the carry over of the 1951 crop into the fall is extremely light so that the situation undoubtedly is improved over what it was a year ago. This is true especially as the government has purchased already some ten million pounds of honey during the new fiscal year.

### Selling, Demand, and Prices

The weather has been universally warm up to October 15 and this has meant a comparatively light demand for honey although we find good demand in the New England states and through the Southeast and southern states. Some of the packers are already hunting for chunk honey to fill their bulk comb orders.

Selling prices vary little from last year, there being a slight dropping in some instances and a stiffening in others. In the Canadian Provinces, if anything, there has been a stiffening in prices and the honey crop as a total probably will be about equal to last year, being considerably heavier in the eastern provinces of Ontario and Quebec and lighter in Manitoba, Saskatchewan and Alberta with about average crop in British Columbia.

Ranging from east to west the average price probably will be 35 cents for one-pound glass and $1.50 for five-pound pails in the eastern sections ranging down to 29 cents and $1.00 as you approach the intermountain territory. Most certainly domestic retail prices cannot be counted upon to be much higher than last year, but undoubtedly avenues of disposal of the crop have been far improved over what they were at this time in 1950 and disposition of the present crop should go along without difficulty, barring unforeseen circumstances.

The importation of foreign honeys under the reduced duty regulations which have been in effect now for some years, undoubtedly has been a deterrent on good prices in the eastern markets. Some of our foreign neighbors, like Argentine, are producing honey which is equal in quality to ours and has heretofore sought European disposal.

### Ton Lot and Higher Prices

There has been a tendency on the whole to maintain prices about equal with government support which is 10.1 cents for white and 9 cents for honey having limited national acceptability. This is particularly true in California where two or three of the large packers have not gone along with the support program and are buying independently, sometimes securing honey below support prices delivered to their packing houses.

On the whole, however, very little honey is selling under support prices as mentioned above. There have been considerable quantities disposed of at a better figure. In the Texas area, for instance, the price probably averages 10¾ cents for white honey with cans returned, with quantities of cut comb selling to the packers at from 18 cents to 20 cents a pound. There are also reports of some Montana cars being sold at 10½ cents and 11 cents F.O.B. shipping point and again the bulk of the quotations still average 10.1 cents which is the support price. We understand one of the larger cooperatives is now buying F.O.B. common Michigan points at 10.1 cents or offering to take in the honey on an 8 cent payment, balance to be settled for as the honey is sold. Independent packers we understand are offering 10 cents for white honey at the apiary.

All in all, we believe the situation is improved over that of a year ago and that although there is no great stiffening in the market as yet, such may appear by the turn of the year after cold weather has come and producers' stocks are moving more generally into the retail channels.

**Honey Wanted**— Cars and less than car. Top Prices.
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# BUY AND SELL

## BEES AND QUEENS

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CAUCASIAN BEES and QUEENS. Write for 1952 prices. Tillery Bros., Greenville, Ala.

THREE BANDED Italian bees and queens for 1952. Write for prices. Alamance Bee Company, Graham, N. C.

## FOR SALE

FOR SALE—Electro Flo Filling Machines. Designed for honey. Fills containers automatically. Write for information or see in operation. Hancock Honey House, Hancock, Iowa.

BEES FOR LEASE AND SALE—Montana, Wyoming, Idaho, Nebraska. Contact Bradshaw & Sons, Wendell, Idaho.

FOR SALE—Full sets (twelve numbers) American Bee Journal for the years 1913, 15, 16, 19, 1921, 22, 29, 1936, 37, 38, 39, 1942, 43 for $1.50 a year while they last. Foreign postage 50c a year extra. American Bee Journal, Hamilton, Illinois.

ONE OF MONTANA'S largest apiaries and packing plants. State wide established market for all honey. 1600 colonies of bees and equipment, disease free. Building 60 x 140. Over 50 miles of registered locations. Write Ronald M. Brown, Box 72, Big Timber, Montana, for full information.

IF YOU DESIRE to buy bees or lease for pollination or honey production, write for particulars. Will deliver in quantity. Baughn Stone, Idabel, Okla.

FOR SALE—Complete Wyoming apiary—800 double hives, 10-frame size, good equipment, 3000 supers, 20 locations in alsike, yellow and white sweet clover and alfalfa territory on North Platte River. Produces finest water white honey. Complete extracting equipment, honey house, modern living quarters, truck, etc. Best hunting and fishing. Investigate and make offer. States Apiaries, Saratoga, Wyo.

FOR SALE—150 colonies bees, 10-frame, 2-story, about 100 extra supers, other equipment. No disease. Located Contra Costa County. H. Pinkwart, 2125 Ricardo Dr. Concord, Calif.

FOR SALE—In lots of 25 or more, 10-frame one and two story colonies bees. In good condition and nearly all young queens. For truck delivery only. T. L. Nicolaysen, Box 578, Ripon, Calif.

26 COLONIES OF BEES, 1½ stories, with plenty of honey. Never any disease. Adam Huebsch, Galena, Illinois.

FOR SALE — Fourteen colonies Italian bees, state inspected. Enough equipment for thirty-one colonies. Price reasonable. Emily Burian, Rt. 2, Cedar Rapids, Iowa, near Ely.

FOR SALE — 230 two-story colonies of bees, no disease, at $15.00 a colony. Included are 175 extra full depth supers, 52 shallow extracting supers and 65 section supers with all other necessary equipment. Roy Bunger, Council Grove, Kansas.

Copy for this department must reach us not later than the tenth of each month preceding date of issue. If intended for classified department it should be so stated when advertisement is sent.

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As a measure of precaution to our readers we require reference of all new advertisers. To save time, please send the name of your bank and other references with your copy.

Advertisers offering used equipment or bees on comb must guarantee them free from disease or certificate of inspection from authorized inspector. The conditions should be stated to insure that buyer is fully informed.

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FOR SALE—130 colonies in 10-frame hives and extracting equipment. Disease free. Leo Kieffer, St. Charles, Minnesota.

## HONEY and BEESWAX WANTED

WANTED—Extra white and light amber honey. Let us ship you the containers. Sell us your honey for CASH on delivery. The Hubbard Apiaries, Manufacturers of Bee Supplies and Comb Foundation, Onsted, Michigan.

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HONEY WANTED—All grades and varieties. Highest cash prices paid. Mail samples. State quantity. HAMILTON & COMPANY, 1360 Produce Street, Los Angeles, California.

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CARLOADS or less of honey and wax. Send sample and price. Alexander Co., 819 Reynolds, Toledo, Ohio.

WRITE FOR SHIPPING TAGS and current quotations on rendered beeswax. Any amount from one pound up bought. If you have 25 pounds or more, save 25% by letting us work it into foundation for you. Walter T. Kelley Co., Paducah, Kentucky.

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THE ONLY COMB FOUNDATION PLANT in the East. We sell foundation, work your wax, render combs and cappings. Robinson's Wax Works, Rt. No. 3, Auburn, New York.

FOR SALE—Filter presses, filter paper of various types for filtering honey. The Cellulo Co., Sandusky, Ohio.

## WANTED

WANTED TO BUY—Small apiary in Montana or Wyoming. Write Box 5, % American Bee Journal.

WANTED—Standard depth 10-frame supers, frames, bottoms, metal top telescope covers, new material. Nealey Honey Co., Aberdeen, Idaho.

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MAN WANTED to help in shop, queen yard and package bee production coming season, to take pay in bees and queens. Can supply livable house near work. No drinkers. Will pay fair wages. References exchanged. S. J. Head, Crossett, Ark.

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NOTICE—Our 1952 Honey Plant, Shurb, and Tree catalogue being unchanged since last year, will not be mailed unless requested by you. Those wishing to order can use last year's catalogue, prices being same. New item list on request. NICOLLET COUNTY NURSERY, St. Peter, Minnesota.

## MISCELLANEOUS

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## Honey Marketing . . .

(Continued from Page 457)

buyers launch upon a price cutting sales program which results in a further decline in the honey market.

It is reported that we have a half million beekeepers in the U. S. If each were to influence the sale of a pound of honey every day, we would sell 182 million pounds of honey in a year. Do you know that we produced only 233 million pounds in 1950? Isn't this the solution? We even have the advantage over producers of other commodities of being widely scattered over our country. Shouldn't we be ashamed of our marketing effort?

## W. Herrod-Hempsall . . .

W. HERROD-HEMPSALL of England is dead, at the age of 79. He, with his brother, have been connected with the British Bee Journal for many years. J. Herrod-Hempsall is still its editor with the help of C. C. Tonsley.

W. H. H. as he was familiarly known in Britain was a booster for British beekeeping. He wrote the book: "Preparing, Producing and Exhibiting Bee Produce," and "Anatomy and Physiology of the Honey Bee." His monumental work was "Beekeeping New and Old" in two volumes comprising some 2,500 pages. Most of this edition was destroyed by fire during the London blitz in the last war.

W. H. H. was particularly noted for his Britain-wide lectures, his teaching, and judging at fairs and exhibits.

## Honey Date Snowballs . . .

Put 1 lb. of pitted dates through the food chopper alternately with 1 cup nutmeats. Add 3 tbsps. of honey, ½ cup of cocoanut and a sprinkle of salt. Shape into balls.

Mrs. Leonard Thrall
Minnesota

## Depreciation Accounting . . .

(Continued from Page 467)

operator, and compensation for the services of the operator as manager. If the profit does not cover these items the business is not profitable.

A beekeeper who does not keep good plant and equipment accounts does not know how much money he is making or losing. He may think he is making no money until he has paid for all his purchases out of his receipts from sales. In reality he should only pay for the depreciation on the equipment for one year out of any one year's receipts. Another man may figure he is making more than he is because he forgets that his equipment will not last forever. Someday he will find he has heavy replacements to make.

Because of some of the things which have had to be discussed, the backyard beekeeper may feel this is too involved. The writer is a backyard beekeeper with only six colonies. His ledger accounts consist of: one plant account with an analysis sheet behind it, a reserve account, an operating expense account and a sales account. He has a folder in which all bee equipment invoices are filed. If any cash purchases are made the facts are recorded on a paper and put into that folder. An analysis of checks drawn and an inventory are made at the end of each year. It is very simple. It does record the facts which actually happen in the business. The cost of all purchases, the items of that cost which have been retired, the amount of the original cost which has been returned to the business through depreciation, the cost of doing business and the receipts from sales are all recorded. Massachusetts.

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## Preliminary Crop Report . . .

Preliminary report of the honey crop as issued by the Bureau of Agricultural Economics at Washington, October 12, estimated the 1951 crop of honey at slightly over 250 million pounds, or an increase over 1950 of about 7 per cent.

The ten states leading in production are California, Minnesota, Florida, Wisconsin, Ohio, New York, Texas, Michigan, Iowa, and Idaho. Production appears to be better in all sections except northwest central and south central states where it is 19 and 4 per cent respectively below last year. The latter must include the short crop in Texas.

Apparently the report does not include the late fall crop which we are inclined to think is going to reduce the excess over last year to some extent.

It is encouraging to note that the report of honey on hand this year as of mid-September is 114 million pounds as against some 120 million last year. Our readers will recall that we had a considerable carryover in 1950 of the 1949 crop.

## Washington Beekeeper Dies

Alfred Fred Johnson, 66, of Kiona, Washington passed away on August 9 at Richland. Mr. and Mrs. Johnson came to Kiona 38 years ago where he served as Northern Pacific agent, later taking up a homestead on Corral Creek. For the past several years Mr. Johnson operated the Benton Trading company. He had a large apiary and was well known among bee men of the state, being one of the pioneer beekeepers of that area. He is survived by his wife and two daughters and several grandchildren.

## Honey . . .

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May its use bring you joy and ecstasy equal to that of the bees that gathered it.

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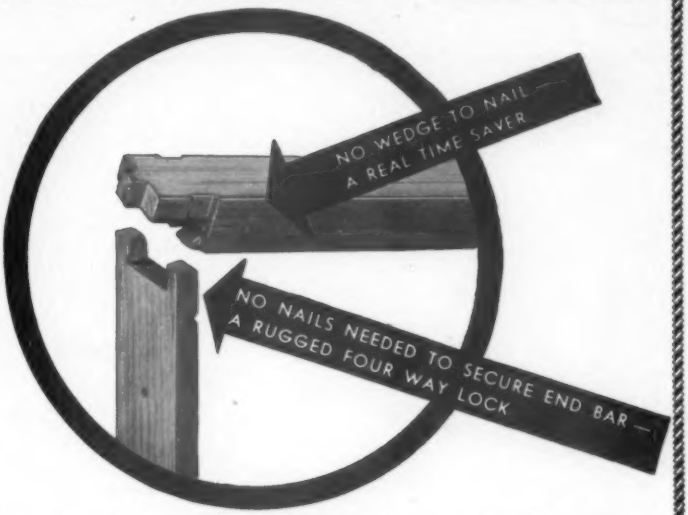


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